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THE

JOURNAL

OF THE

ROYAL ASIATIC SOCIETY

OF

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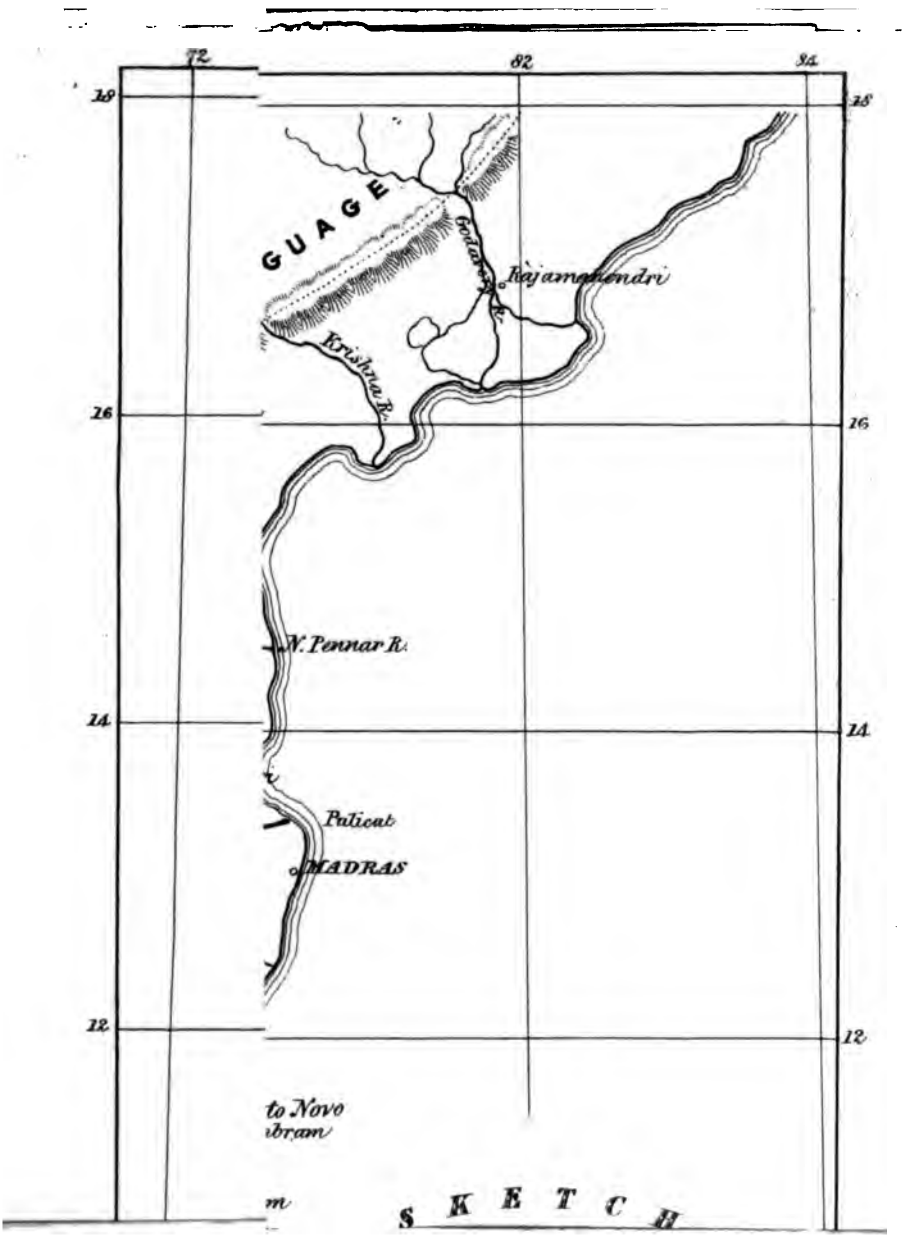
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JOURNAL

OF

THE ROYAL ASIATIC SOCIETY.

ART. I.—*On the Geographical Limits, History, and Chronology of the Chera Kingdom of Ancient India, by* MR. J. DOWSON.

TRADITION and native records represent the southern portion of the Indian peninsula as being anciently divided into three contemporary kingdoms. 1. The Pándya. 2. Chola or Sora. 3. Chera, Sera or Konga. Of the first, a valuable account has been supplied by Professor Wilson, in Vol. III. of the Society's Journal; and of the other two, slight sketches have been given by the same learned writer, in the Introduction to his Catalogue of the M'Kenzie Collection: a more detailed notice of the last is the object of this paper.

The notices of this kingdom which have been published, have been drawn chiefly from a Tamil memoir, in the M'Kenzie Collection, called "Konga desa Charitra," or "Konga desa Rájákkal," of which a translation exists in the Library at the East India House; it has been noticed, in Professor Wilson's Catalogue, at p. 199, Vol. I., and in page 1 of the Rev. W. Taylor's Analysis of that Collection.

This Memoir gives the history of the Chera dynasty, of those Chola monarchs who held the country of Chera by conquest, and also of the Hoyisála or Bellála and the Vijayanagara dynasties, into whose power it successively fell. It is the only paper in the collection from which any useful notices of the Chera monarchs can be obtained, and the history of that dynasty rests at present mainly upon it. In style it is stated to be very different from the generality of Hindu writings of this class, and independently of its being our only authority, it merits a fuller notice than has yet been given of it. From the before-mentioned translation, the following Abstract of the first portion which relates to the Chera dynasty and its Chola conquerors, has been prepared, in which all important and useful information on that subject has been retained; the parts relating to the Bellála and Vijayanagara kings will be useful in any future accounts of those dynasties, but are unnecessary for our present purpose.

The Rev. W. Taylor speaks of this memoir in high terms of commendation: he made a translation of the whole of it, which he intended for insertion in the "Journal of the Bengal Asiatic Society;" it has however never appeared. In his Analysis of the M'Kenize Collection, he says it "is for the most part free from the mythological fable which usually disfigures Hindu documents, and is well supported by dates, in general referred to inscriptions which are mentioned, and many grants of land are specified with such reference. On the whole this is one of the best, and most valuable manuscripts in the collection." In qualification of this praise however, it must be observed that, the accounts it gives of the Hoyisála and Vijayanagara kingdoms differ in some instances from others, particularly in reducing the number of kings; and that implicit credence cannot be given to the dates in the first Part, will be seen from the observations which follow the Abstract; those of the second and third Parts appear to be tolerably correct.

The translation of this document in the volume of MSS. at the India House, is preceded by an introductory note, and an analysis of the first part relating to the Chera desa; to these no name is attached, but they are evidently the work of an European. The introductory matter supplies some valuable geographical information, which has been incorporated into the following observations upon that subject.

We will now give the abstract of the memoir, reserving further comment for the inquiry which will follow it.

1. The first king, named Sri Víra Rája Chakravartí, was born in the city of Skandapura, and was of the Reddy[1] or Ratta tribe (culam), and of the Súrya vamsa (solar race); he obtained the government of the country and ruled with justice and equity.

2. Govinda Ráya, son of Víra Rája, was the next king.

3. Krishna Ráya, son of Govinda Ráya, ruled next.

4. Kála Vallabha Ráya, son of Krishna Ráya, was next in succession.

Of these kings nothing more than their equity, justice, and renown is recorded.

5. Govinda Ráya, son of Kála Vallabha, was the fifth in succession; he conquered the hostile rajas, exacted tribute from them, and ruled his country with justice and renown. This king made a grant of land to a Jaina Brahman, named Aristánan, for the performance of worship in the Jaina basti (temple) of Kongani Varma, in Vaisákha, A. Sál. 4,—year of the cycle, Subhánu (A.D. 82).

6. Chaturbhúja Kanara Deva Chakravartí succeeded; he was of the

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[1] A Telugu tribe. See Ellis's Mirasi Right, p. xii.

same race, but his parentage is not mentioned. He is stated to have had four hands[1]; he was versed in the art of archery and various sciences, and ruled with equity and renown, "obtaining the honorary insignia of all the other rájas."

A jaina named Nága Nandi, a learned and venerable man, was minister to the three last named rajas.

7. Tiru Vikrama Deva Chakravartí I., son of Chaturbhúja Kanara, succeeded, and was installed in A. Sál. 100 (A.D. 178), at Skandapura. The celebrated Sankaráchárya (called in the MSS. Sankara Deva) came to this king and converted him from the Jaina to the Saiva faith. After his conversion he marched into the southern country and conquered the Chola, Pándya, Kerala, and Malayálma countries, after which he returned. He made many grants in charity and in encouragement of the learned; a deed of grant, dated Vaisákha-sud A. Sál. 100,—year of the cycle, Sidhárthi (A.D. 178), to Narasimha Bhatt, Guru, of the Bharadwája gotra, is stated to be in the temple of Sankara Deva, at Skandapura. This king governed the Karnáta as well as the Konga desa.

8. Kongani Varma Ráya succeeded; he was of the Konávar or Konváyan tribe and Ganga kula, and was installed at Vijaya Skandapura in A. Sal. 111,—year of the cycle, Pramodúta (A.D. 188), and reigned for fifty-one years; he exacted tribute from many rájas whom he conquered, and "by his munificence and charity cleared away the sins of his predecessors of the Ganga race;" his title was Srimat Sampati Kongani Varma Dharma Mahádhi Ráya.

9. Srimat Mádhava Mahádhi Ráya, son of Kongani Varma, succeeded, and was installed in the government of the Konga desa, at Skandapura; he was learned in all the sciences and maxims of justice, ruled with equity, and was renowned for his munificence to the learned and the poor.

10. Srimat Hari Varma Mahádhi Ráya, son of Mádhava Ráya, succeeded; he was installed at Skandapura, but "resided in the great city of Dalavanpura, in the Karnáta desa." He exacted tribute from many different rájas, and was renowned as an eminent hero among all kings; he ruled according to the maxims of polity, and being very wealthy made many grants of land, one of which is recited, viz., a grant of land in Tagatúr, a petta (suburb) of Tálakád to the Brahmans for the worship of Múlasthán Iswara in that place, dated Panguni, A. Sal. 210,—year of the cycle, Saumya (A.D. 288).

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[1] The writer of the MSS. has evidently understood the title *Chatur-bhúja*, "four armed," as having a personal and literal reference to this prince; it is however a title of Vishnu, which is frequently assumed by his followers.

11. Vishnu Gopa Mahádhi Ráya, son of Hari Varma, succeeded, and was installed at Tálakád or Dalavanpura; he conquered the *Púrva-dik* (eastern country) and was renowned as a great warrior; he made many grants to Brahmans and to the poor, and being a zealous votary of Vishnu, erected many temples to that deity; hence he derived his name of "Vishnu Gopa." "The Konga and Karnáta desas were both under his command:" having no children he adopted a lad of his own race, named him Mádhava, and resigned the crown to him.

12. Mádhava Mahádhi Ráya, adopted son of Vishnu Gopa, was installed at Dalavanpura, and ruled for some time under the orders of his father; but a son being born to Vishnu Gopa, that son was installed in the government.

13. Krishna Varma Mahádhi Ráya, son of Vishnu Gopa, was installed at Dalavanpura, and on that occasion he granted some "countries near the Kanavái and the mountains to his adoptive brother, Mádhava Mahádhi Ráya, who had lately ruled;" he governed the kingdom equitably; he was a zealous votary of Siva, and having set up a Linga at Dalavanpura granted some lands for its support: he had no son.

14. Dindikára Ráya, son of Kúláti Ráya, of the family of Vishnu Gopa's adopted son Mádhava, ruled for some time, but was deposed by he Mantri Senápati of the late rája, who installed

15. Srimat Kongani Mahádhi Ráya, son of Krishna Varma's younger sister, in A. Sál. 288,—year of the cycle, Parábhava (A.D. 366). This prince was learned in sciences and in languages, "he conquered all the desas and took tribute from their rájas," and granted many charities. A person named Yárachandra Dindikára Ráya, who had some desas under his charge during the reign of this king, made a grant of the village of Parola-kanúr near Alúr gráma.

16. Dúrvanítí Raya, son of Kongani Raya II., succeeded and ruled the Konga and Karnáta desas. This prince is represented to have been deeply versed in magic and the use of mantrams; by repeating the mystical word OM when his enemies were drawn up against him, they were enervated and dispirited, so that he obtained easy victories over them. He conquered the countries of Kerala, Pándya, Chola, Drávida, Andhra, and Kalinga, and exacted tribute from the rajas thereof; all hostile kings were afraid of him, and hence he was called Doony Veeroota Ráya (Dharma virodhi, or Punya virota) the unjust Ráya.

17. Múshakára Ráya, son of Dúrvanítí, succeeded, he was learned in the military art, and took tribute from those rájas whom his father had conquered, keeping them in subjection and fear. He resumed the

grants which had been made to the Brahmans and the poor; and hence he obtained the title of Brahmahatya Ráya.

18. Tiru Vikrama II., son of Múshakára, succeeded; he was a learned man and well versed in the science of government; "he obtained possession of all the desas," and ruled them with justice.

19. Bhú Vikrama Ráya, son of Tiru Vikrama succeeded, and was installed in A. Sál. 461,—year of the cycle, Sidhárthi (A.D. 539). He ruled the two countries of Konga and Karnáta, and conquered many other countries. From the great number of elephants which he procured, the title of Gajapati was given to him; he had several weapons made of ivory which he kept by him as trophies of victory. He maintained all the charitable and religious grants which had been made by his ancestors in the countries which they had conquered, as well as in the Chera and Karnáta countries.

20. Kongani Mahádhi Ráya III., succeeded his father Bhú Vikrama, and governed the countries with justice and equity. He made his brother commander of his armies, and several rájas having refused to pay tribute, he collected his armies and conquered the Chola, Pándya, Drávida, Andhra, Kalinga, Varada, and Maháráshtra desas, as far as the Nerbadda river, and took tribute from them; he then returned to his capital, Dalavanpura, which he strongly fortified, and made many benefactions. The title of Bhú Vikrama Ráya was taken by him. He acted in these campaigns, and in the government of the country, under the advice of his youngest brother Vallavagi Ráya.

21. Rája Govinda Raya succeeded his father, and ruled the country with equity and renown, subduing all the hostile rajas. He was "esteemed a most pure person in the Gangakula," and from his attachment to the Lingádhárí sect, was called Nandi Varma. This prince resided for some time at the city of Muganda-pattana.

22. Sivaga Mahá Ráya, brother of Govinda Ráya, succeeded; he was installed at Dalavanpura, but resided for some time at Muganda-pattana, ruling the kingdom justly. In A. Sál. 591,—year of the cycle, Pramodúta (A.D. 668), he made a grant of the village called Halihalli to a learned Brahman of Drávida desa.

23. Prithivi Kongani Mahádhi Ráya, grandson (son's son) of Sivaga, succeeded; his commander-in-chief, Purusha Ráya, conquered the hostile rájas, and the king conferred upon him a grant of twelve villages near Skandapúra, and the title of Chavurya Parama Narendra Senádhipati, in Chaitra, A. Sál. 668,—year of the cycle, Párthiva (A.D. 746). This king ruled the country in felicity, and was known by the title Siva Mahá-rája.

24. Rája Malla Deva I., son of Vijayáditya Ráya, younger brother of

Prithiví Kongani Ráya, succeeded, and ruled the Konga and Karnáta desas. This prince always dressed with magnificence and elegance. He is recorded to have made a grant to his Senádipati "of twelve villages belonging to Vijaya Skandapura, situated above the Kanavái, along with Vijaya Skandapura." The mantris of his tribe, the nobility, and the Mallikárjuna Swámí, were declared witnesses to the grant.

25. Ganda deva Mahá-ráya, son of Malla-deva, succeeded; he was a powerful prince, and obtained the different insignia of all the rajas. He fought with the Drávida Raja in Kánchi desa, defeated him and exacted tribute from the country; he fought also with the Chola Raja, "into whom he carried terror, and afterwards established amity with him." He maintained a friendship with the Pándya Raja, and was renowned among the Ganga-kula for protecting the kingdom.

26. Satya Vákya Ráya succeeded his father Ganda deva, and ruled the kingdom in equity and justice, punishing the wicked and protecting the good. He was never failing in truth, hence he obtained the title of Satya Vákya Ráya (the truth-speaking king).

27. Gunottama Deva, brother of Satya Vákya, was installed at Dalavanpura; he ruled the kingdom in an equitable manner, allowing many charities, and maintained friendship with the other rájas.

28. Malla Deva Ráya II., younger brother of Gunottama, succeeded during the life-time of the latter, whom he is stated to have kept at Vijaya Skandapura. This king was a very valiant man and defeated the Pándya Raja, who had attacked him.

In the reign of this prince, his brother Gunottama made a grant of land in Ani, A. Sal. 800,—year of the cycle, Vikari (A.D. 878), to a Jaina, for the performance of worship to a Jaina deity.

On the 7th Vaisákha sud, A. Sal. 816,—year of the cycle, Ananda (A.D. 894), a person named Tirumalayan, built a temple, and to the west of it erected an image of Vishnu, which he called Tirumala Deva, upon some land "in the midst of the Cávéry," where in former times the western Ranganád Swámi had been worshipped by Gautama Rishi, but which was then entirely overrun with jungle. This place he called Srí Ranga pattana (Seringapatam).

CHOLA CONQUEST.

29. Vijaya Ráya Aditya Varma, son of Vijayada[1] Ráya, who had been installed at Tanjore as King of the Chola-desa, came into the Chera-desa, conquered the "Vedar[2]" Rajas thereof, reduced the capital

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[1] The introductory note calls him "Virata."

[2] A tribe of hunters, said to be the aborigines of the peninsula.

Tálakád, and governed the country. He made many charitable grants in Chera.

30. Vira Chola[1] Ráya, son of Aditya Varma, was installed at Tanjore, and became King of the Chera and Karnáta desas. He was a very valiant man and conquered many desas; hence he obtained the title Víra (hero), and from being a zealous follower of Vishnu he was called Náráyana; thus, Víra Chola Náráyana. "He and the Pándya Raja both conquered many desas; he went to Sinhala desa and conquered the raja thereof, thereby obtaining great fame." He granted many agrahárams in free gift to Brahmans; one situated on the banks of the Cávéry in Chola-desa, was named Víra Náráyanapur. He one day saw on the sea-shore the Sabhápati of Chillambara (Siva), attended by Párvati, dancing and beating the damaraka (a kind of drum); he therefore expended great sums of money in building the Kanaka or golden Sabhá. Having many sons, he appointed Dásoditya Ráya to be King of the Chola-desa, and Arunjeya Ráya to the Drávida desa, and died.

31. Dásoditya Ráya was installed at Tanjore, and then performed the installation of his elder brother, Arunjeya Ráya, as King of the Drávida desa. He ruled the Chera country in an equitable and charitable manner; he granted four agrahárams on the Cávéry, and named them Chatur samudram; he died childless.

32. Parandaka Ráya, son of Dásoditya's brother Arunjeya, conquered the Pándya raja and took tribute from him. He married a virgin named Chittiri, daughter of Chati Ráya; by her he had a son, who having conquered many enemies, was called Arimalli; he died before his father, who by the same wife had many other sons. This king granted many agrahárams, and other charities.

33. Divya Ráya, son of Parandaka, succeeded, and ruled the Drávida, Chera, and Karnáta desas. He was alarmed by Víra Pándya, who came to Tanjore to fight, but defeated him and cut off his ears, upon which the Pándya Raja returned to Madura; from this feat he was called Arititu Ráya. He then went to conquer the Uttara desa (northern country), leaving his mantri in charge of the public affairs at Tanjore, but remaining absent a long time, quarrels arose between his relations and the mantri, whose authority was unheeded; upon hearing of which, he returned and restored tranquillity, and punished those who had rebelled. After this he conquered Satya Kánakár, of the Vaitonda vamsa, and despoiled him of a great quantity of precious stones, which

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[1] A note in the MSS. states, that "according to the Condatoor MSS. he reigned from Saliváhana 849 to 899 (A.D. 927 to 977)."

he gave to the Brahmans in charity, in order to obtain the favour of Nárâyana. He caused many canals on the Cávéry to be dug, and made many charitable grants; he had no sons, he therefore installed his younger brother, Ari Vari Deva.

34. Ari Vari Deva, brother of Divya Ráya, ruled the desas of Chola, Drávida, Konga, and Karnáta. His brother, Divya Ráya, marched with an army to Madura, defeated the Pándya Raja, and forced him to take flight: he then reduced the Pándya-desa, and having plundered Virenjipuram[1] returned to Tanjore. The mother of the defeated and fugitive Pándya Raja, being a near relative to the Chola Raja, the latter, after having received large quantities of jewels and money, restored Madura to the Pándya king, and lived afterwards in amity with him. "The Senádhipati (commander) of the Pándya Raja, who was a near relation, came to the Chola Raja;" his name was Amra Bhojangan, and the king being pleased with him gave him the command of an army, with which he marched as far as Saha parvata to the west, and from thence into the Kerala desa, the raja of which attempted to defend the country, but Amra conquered the Kollúr, Indra-giri, and Nila-giri countries; "and that raja having lost everything, and being defenceless, embarked on ship, and fled to the islands in the midst of the ocean." By command of his master, he buried all the treasures, jewels, and whatever he had plundered, in the Kanavái sthala of Siva; Bhíma Ráya, having heard of these events, attacked him, but was defeated, and lost his son. Amra then marched into the Kalinga desa, and took tribute from the rája, and proceeded from thence to the Narmada river, where he conquered many rajas; having subdued Vaitonda Ráya, Kámaranava Ráya, Dana Pallia Bhíma Ráya, and Amán Ráya, and taken from them money, jewels, the ladies of their palaces and tribute, he returned to the raja, bringing among the plunder the golden statue of Bhíma Ráya, having planted the "victorious tiger-standard" in the Pushkama-dik (western country), on the Narmada river and on Mahendra-giri. The raja was highly pleased on seeing the treasures, and observing that his grandfather had built only a Kanaka Sabhá to the Chillambara deity (Siva); he built Gopuras (spires, towers), Maddals, (inclosures), Mandapams (image-houses), and Sabhás (holy places or apartments), and granted many jewels to the deity. He resided at Tanjore, and ruled both the Konga and Karnáta desas, making numerous grants of land and other donations. He made a grant of the village of Káriyúr, in Tálakád, to the north of the Chera desa, in agrahâram to the Brahmans of Tálakád, placing Vaisyas

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[1] There is a place of this name in the Drávida desa; it is situated a little to the west of Vellore.

in charge of it, and called it Rája-rája-pura. He thus made many grants on the 5th Mágha sud, A. Sal. 926,—year of the cycle, Viswavásu (A.D. 1004).

The notice of the Chola dynasty here ends abruptly, and the MS. proceeds to the history of the Bellála rulers.

THE first point of inquiry which presents itself is that which relates to the Geography of the Chera Kingdom; its boundaries, the situation of its capitals, and the locality of the several desas and cities, which are mentioned in the preceding paper; referring more particularly to countries which were under the Chera rule.

The boundaries and extent of Chera, as defined by Tamil classic writers, are given in the second volume of the Rev. W. Taylor's Translations of Historical MSS.[1], in the following words:

STANZA SUPPOSED TO BE BY AVYAR.

"The northernmost place is Pazhani (Pyney), the most eastern is Chengodu (Trichengode), the most western is Kozhikudu, on the south is the shore of the sea; in all eighty kadams (eight hundred miles), is called the boundary of the Sera country."

STANZA BY AVYAR.

"The northernmost place is Pazhani, to the south is the southern Kasi, to the west is Kolikudu, the sea-shore on the south is called the boundary of the Chera kingdom."

A PROSE DESCRIPTION PRESUMED TO BELONG TO MIRTANJEYA PATTAR.

"On the north Pazhani, to the east the great town (or Perúr), on the south the sea, on the west the great mountain; from east to west forty kadams (four hundred miles), from south to north forty kadams (four hundred miles), making together eighty kadams (eight hundred miles). Its revenue ten millions of pattans, of which four make a kali pan."

To these may be added, that quoted by Professor Wilson, in his Catalogue of the M'Kenzie Collection[2].

TAMIL VERSE.

"The Palini river on the north, Tencasi in Tinnavelly on the east, Malabar on the west, and the sea on the south."

Professor Wilson, in the Introduction to the Catalogue of the M'Kenzie Collection, founding his description chiefly on the last verse, says, " The northern limits of Chera varied at different periods, being originally placed at Palini near Dharápura, whilst at a subsequent period the capital, Dalavanpura or Tálakád, above the Mysore Gháts, indicates a considerable extension of the boundary in that quarter, and the Chera principality probably included the greater portion of Karnáta. Its eastern limits were the possessions of Chola and Pándya, and the western those of Kerala. In its early state, however, it comprehended the extreme south of the Malabar coast or Travancore, and consisted of that province, Wynád, the Nilgiri mountain district, the southern portion of Coimbetore, and part of Tinnevelly. In this tract, we have in Ptolemy the people called *Carei*, and not far from it, *Carura Regia Cerebothri*, in which, making an allowance for inaccuracies of sound and expression, we have the Cheras, and Cárúr still a city in this district, and Cherapati the sovereign of Chera[1]."

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[1] Taylor's MSS. App. vol. ii. p. 26.

[2] Wilson's M'Kenzie Cat. i. 198.

The foregoing memorial verses are upon the whole tolerably concurrent; all four make the sea to be the southern boundary, and Calicut (Kozhikudu) or Malabar the western. The first makes Trichengode in Salem, and the last Tenkási, or the southern Kási, in Tinnevelly, to be the eastern boundary; the second verse makes two southern boundaries (the sea and Tenkási), omitting entirely the eastern, we may therefore reasonably include that Tenkási is intended for the eastern; the third verse gives " Perúr" as on the frontier, but as that term means simply " great town," it cannot be definitely applied. Trichengode and Tenkási are at a great distance from each other, but each might be considered as an eastern boundary, one being situated towards the northern extremity of the kingdom, the other toward the southern; a line drawn from one to the other might therefore be considered the eastern frontier: such a line would pass a little to the west of Cárúr, mentioned by Ptolemy as included in the Chera desa; and this town was, as Colonel Wilks informs us, so near the frontier, that it was alternately in the possession of the Chera, Chola, and Pándya sovereigns[2]. The northern frontier cannot be so easily settled; the first three verses give Pazhani as the boundary; the fourth, however, says the Palini river (the same name but a different orthography); the Pazhani of the first three verses has been considered to be the town of that name, variously spelt Palini, Pulney, and Pyney; this town is situated in the south of Coimbetore below Dharápura, whereas, Calicut and Trichengode are both far to the northward; the Cárúr of Ptolemy is also north of it. This town then could not have been the northern boundary; the Palini river of the fourth verse may help us in discovering the correct frontier. After diligent search no river of this name has been found; but various circumstances lead to the belief that the river Bhowany, which running eastward, falls into the Cávéry at Bhowany kudal, or as it is sometimes written Boviny Coral, a little above Erode, is intended.

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[1] Wilson's M'Kenzie Cat. Int. p. 92.

[2] Wilks's Sketches of Mysore History, i. p. 8.

The words in the lines quoted from the Tamil poetess Avyár, as given by Mr. Taylor, are, Vadakku-talam Pazhani, *i. e.*, north the sthalam Pazhani. A sthalam is a holy place, a place where a temple is erected in honor of some deity; now we have only to suppose an easy clerical error of one letter to have crept into the verse, and we shall remove the only obstacle to the tracing of a consistent line of boundary from the accordant testimony of the authorities referred to. If we substitute *v* for *zh* in the word Pazhani we have Bhavani, (for the same symbol in the imperfect alphabet of the Tamil expresses *p* and *b* and their respective aspirates,) and Bhavani would be a legitimate feminine form of Bhavan, signifying the wife of Bhavan or Siva, the goddess Párvatí, who has given name to the sthala, still known as Bhowany. Whether this conjecture be right or not, it appears highly probable that the river Bhowany was near the northern frontier, which must in all probability have been nearly the same as that between the British district of Coimbetore and Salem and the territories of the Mysore Raja, as the following observations will show.

1. A line drawn from Calicut on the Malabar Coast to Trichengode in Salem, these places being respectively mentioned in the Tamil verses as the western and eastern boundaries, would pass in the immediate vicinity of the Bhowany river.

2. The introductory note to our MSS. informs us, that Skandapura, the capital of the Chera kingdom, was situated a short distance west of the Guzzelhatty Pass; no direct confirmation of the locality here assigned to Skandapura has been met with; it appears, however, to be verified by our MSS., which says that Tiru Vikráma (No. 7), marched southward to Chola desa, and it may therefore be admitted as correct. The situation thus given to Skandupura, and the fact of Tiru Vikrama marching southward to Chola, render it necessary to place the frontier as far north as the boundary proposed.

3. Mr. Buchanan, in the Narrative of his Mysore Journey, makes a few incidental observations which also confirm it; he mentions Sanklidrug, a little to the north of Trichengode in Salem, Satimangala, near Danaikancotta in Coimbetore, and Nidi Cávil, about forty miles N.N.W. of Sanklidrug, as included in the Chera desa, Nidi Cávil being as he states, upon the frontier between Chera and Karnáta[1];

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[1] Buchanan's Mysore Journey, vol. ii., p. 183, 185, 237 and 248.

he further mentions Coleagala and Arcotár (the former of which is situated a short distance in the Mysore territories, and the latter, on the borders of Coimbetore,) as being towards the southern extremity of Karnáta[1].

Concluding then upon the foregoing grounds, that the northern boundary must have been nearly the same as that of the modern Coimbetore and part of Salem; the outlines of Chera may be stated as follows:—

To the north it had the country of Karnáta, which it joined among the Ghats, nearly upon the present Mysore frontier: stretching from thence eastward it penetrated into the district of Salem as far as Sanklidrug or Trichengode: from thence it proceeded southward (Chola and Pándya being to the eastward, and the towns of Cárúr in Coimbetore and Tenkási in Tinnavelly near the frontier line,) to the coast of Travancore; and it included the western coast, as high up as Calicut in Malabar[2].

The Malabar district cannot, although included in the Chera kingdom, be considered as part of the Chera desa, for it was included in the ancient Kerala desa; the northern parts of Malabar above Calicut may be regarded as remnants of the ancient Kerala kingdom, which, together with the district of Wynád, did not fall under the sway of the Chera rajas before the conquest of Karnáta, in which desa Wynád was included[3].

The boundaries thus assigned to Chera, are in accordance with the general description of that country usually given, as consisting of Coimbetore and Salem[4]. To define, however, the boundaries of this or any other of these ancient kingdoms with exactitude is quite impossible, as they were continually varying according to the strength, ability, and ambition of their respective rulers.

The seventh king in our MSS. is represented as "ruling the country together with the Karnáta desa;" this was undoubtedly a conquest, but whether of his, or of his predecessors, we are not informed. This country is always mentioned in our MSS. as distinct from the Chera desa, although Dalavanpura or Tálakád in Karnáta, became at a later period the capital of the extended kingdom.

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[1] Buchanan's Mysore Journey, vol. ii., p. 242.

[2] A list of titles of the Chera, Chola, and Pándya sovereigns, (Wilson's M'Kenzie Cat., vol. ii., p. cxxix., No. 24), gives the following among fourteen titles of the Chera Rajas. "Malayaman," Lord of Malaya: "Colly verpen," Lord of the Colly mountain in Salem.

[3] Buchanan's Journey, vol. ii., p. 484.

[4] Wilks's Sketches, &c., vol. i., p. 8.; Buchanan's Journey, vol. ii., p. 183, 185, and 304.

The boundaries of ancient Karnáta are no better defined than those of Chera; it consisted of the central districts of the peninsula, including the Mysore territories of the present day. The gháts present a good natural frontier, and for some distance on the east and west are recognised as its bounds; the southern frontier appears to have joined the Chera dominions, and is therefore defined by the northern boundary of that kingdom. An inquiry into the position of the northern frontier of Karnáta is unnecessary for our present purpose, as it seems clear that the whole desa could never have come under the rule of the Chera monarchs, for the Kadamba dynasty ruling at Banavási by the Varada river upon the frontier between the modern Mysore and Canara, and the Chalukya monarchs, whose capital was Kályán, and whose conquests appear to have extended as far southward as Banavási, were in existence before the extinction of the Chera rule, and must have occupied a considerable portion of the north and west of Karnáta. Of the former race, Professor Wilson mentions inscriptions from A.D. 168 to 1336, throwing some doubt however upon the first date[1]. Mr. Walter Elliott fixes the era of one king of this line about A.D. 580 or 600[2]. In reference to the latter or Chalukya dynasty, Mr. Elliot remarks, that proofs have been obtained of the possession of sovereign authority by the Chalukyas, from about the middle of the fifth century of our era[3].

The city of Dalavanpura or Tálakád, which under the tenth prince became the capital of the extended dominions of the Chera monarchs, was situated on the north bank of the Cávéry, about thirty miles east of Seringapatam, and immediately upon the frontiers of the present Mysore and Salem; its ruins are still known by the name of Tálakád. The introductory note to our MSS. informs us, that "it must have been a very splendid and extensive city, the Cávéry inclosing its fortifications on three sides; it was called the southern Gayá; five or six celebrated temples are still standing, many inscriptions being visible on their walls." When Mr. Buchanan visited Tálakád, he found only one temple which was dedicated to Siva, many others having been overwhelmed with sand, the tops of them alone remaining visible; an inscription upon the preserved temple he could not decipher[4]. Could these inscriptions have been procured, they would probably have thrown some valuable light either upon the Chera or Hoyisála dynasties, Tálakád having been at successive periods the capital of each.

Muganda-pattana, at which the twenty-first and twenty-second princes are said to have resided, was, according to the introductory note, about forty-eight miles north-east of Seringapatam, but the name cannot be traced in the maps.

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[1] Wilson's Catalogue of M'Kenzie's Collection, vol. i., Int. xcviii.

[2] Journal of Royal Asiatic Society, vol. iv., p. 36.

[3] Ib. p. 4.

[4] Buchanan's Mysore Journey, vol. ii., p. 162.

By "the Kanavái" is probably intended the Guzzelhatty Pass, the word meaning in Tamil, "a narrow pass in the mountains[1]."

The frequent reference in the MSS. before us, as well as in all native historical memorials, to the great geographical divisions of peninsular India, known to the Hindus from the earliest times, and still familiar to all among them who have any pretensions to the character of scholars, renders it desirable to take a rapid view of the limits assigned to them by the best authorities, as far as the industry of European research has been enabled to trace them. The accompanying Map will assist the understanding of the following summary.

Proceeding from Cape Comorin up the eastern side of the peninsula we have first the kingdom of Pándya, which is said to have extended from thence to the Vellar river; but here a difficulty arises, for the river of that name falling into the sea at Porto Novo, would have to the south Tanjore and Trichinopoly, the first of which is acknowledged to have been the capital, and the second, a place of importance in the Chola desa. Is it not probable that the frontier river intended was the Vayaru or Vaygaru? The frontier was probably a little higher up than the Vayaru, and extended further northward in the interior than on the coast; our introductory note says it was in the neighbourhood of Dindigal, and Colonel Wilks's observation upon Cárúr before adverted to, makes it still higher than the latter place. The capital cities of Pándya were, Kurkhi, (supposed by Professor Wilson to be the Kolkhi of the Periplus), next Kalyánapur, and lastly, Madura[2].

Adjoining Pándya to the northward was the Chola desa, which extended, according to the introductory note, as high up as Chillambram on the Vellar river, and according to other authorities higher up, as far as the Pennar or southern Pinakini river, which appears to be the correct line of boundary. Territories beyond both these rivers were governed by the Chola rajas, but those situated to the north of the Pennar formed part of Dravida proper. The capitals of Chola were Wariur (properly Uriúr, supposed by Professor Wilson to be the Orthoura of Ptolemy,) on the Cávéry, Kumbhakonam and afterwards Tanjore[3].

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[1] Rottler's Dictionary.

[2] Journal of Royal Asiatic Society, vol. iii., p. 203; Tamil verses, in Taylor's MSS., vol. ii., App. p. 25.

[3] Wilson's M'Kenzie Catalogue, vol. i., Int., p. lxxxi; Tamil verses, in Taylor's MSS. vol. ii., App. p. 26.

The title Drávida has been used in a wide sense, as including the three kingdoms of Chera, Chola, and Pándya, throughout which the Tamil language was, and is, vernacular[1]. But in its more restricted and proper acceptation as employed in our MSS., it designates the country which extended from the northern boundary of Chola on the Pennár river, as high up as Calastry or Tripathi; the ghats bounding it on the west and the sea on the east[2]. Its limits, south and north, correspond with those marked out by Mr. Ellis, in his valuable "Replies to the questions on Mirási right," as the boundaries of Tondamandalam. The capital was Kánchi or Kanji-puram (Conjeveram). The twenty-fifth prince in our MSS., is stated to have fought with the Drávida Rája in Kánchi desa; this may have been either a Chola viceroy, this desa having been conquered by the Chola rájas at an early period, or it may have been a chief possessing power in territories not then subject to the Chola rule. The assertion of our MSS. that the last Chola raja mentioned, plundered Virenjipura, a place as before stated in the neighbourhood of Vellore in this desa, would indicate that the whole of this desa was not then subject to the Chola kings.

Northward of Drávida were two desas, Kalinga occupying the sea-coast up to Odra or Orissa, of which the capitals were, first Srikakula (Cicacole?) and afterwards Rájamahendri; and Andhra desa occupying the interior of the country[3].

Proceeding from the southern extremity of the peninsula up the western coast, Kerala in its widest sense occupied all the country below the ghâts from Cape Comorin to the Konkana. This tract was however divided into four or five desas, and the term Kerala, in its proper and limited signification, appears to be applicable to modern Malabar, and according to Buchanan extended as high up as Chandragiri in Canara, where a river separated it from Tuluva[4]. Kerala and Malaya are by some considered to be the same, but in our MSS. they are always mentioned as distinct countries; from the meaning of the word Malaya, the mountainous districts are evidently intended.

The Konkana extended, as at present, along the coast, from the northern boundary of Kerala, below the modern Goa, to the latitude of Bombay; the Maháráshtra desa, or Mahratta country, is to the east and north of it; and Gúrjara is the modern Guzerat.

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[1] Wilson's M'Kenzie Catalogue, vol. i., Int., p. xxviii.

[2] Buchanan's Mysore Journey, vol. iii., pp. 90 and 459.

[3] Wilson's M'Kenzie Catalogue, vol. i., Int., pp. cxvii. and cxxii.

[4] Mr. Ellis in Professor Wilson's M'Kenzie Catalogue, i., p. XLV. Buchanan's Mysore Journey, vol. ii., pp. 347, 474; vol. iii., p. 14, and map in vol. i.

THE next point to which we may direct our attention is the time in which the princes recorded in our MSS. reigned. Mr. Taylor remarks in respect of our MSS. that it is well supported by dates: it is certainly true that the notices it affords of the reigns of the various sovereigns, contain a greater number of dates than is common to such tracts, yet it will be found that little use can be made of those dates without considerable modifications, though they would afford valuable data, in connexion with inscriptions recording gifts of the Chera princes, to adjust the chronology of that kingdom.

The M'Kenzie Collection contains nearly five hundred inscriptions procured in the country subject to these kings, some of which probably belong to this dynasty, but unfortunately none of them appear to have been translated[1].

That the dates given in the MSS. (which are mostly referred to grants of land), will not, if taken collectively, produce a result claiming our credence on the general principles applied in such cases, will appear from the following abstract.

	A. D.
The Fith king made a grant in	82
Seventh king installed and made grant in . .	178
Eighth king installed in	188
Tenth king made a grant in	288

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[1] Wilson's M'Kenzie Catalogue, vol. ii., App. pp. 125,6.

In the Journal of the Asiatic Society of Bengal, for April, 1839, there is a translation of a copper grant, which Mr. H. T. Prinsep conjectured to have been made by a king of this dynasty. It is a grant of land by the Rája of Láta, a country mentioned in most of the lists of desas, but of which the exact locality has not been determined. Professor Wilson, in the second edition of his Dictionary, calls it "the upper part of the Dekhan," and this agrees with the grant in question, from which we learn, that at the period at which it was made there were four kingdoms occupying part of the Dekhan and Hindustan, namely, Gúrjara, westward, Málwa, centrical, Gaura, eastward, and Láta, southward; the capital of the last named kingdom was Elapur, founded by Krishna Raya. The date of the grant is A.D. 812, and the princes mentioned in it are, 1. Govind Raja; 2. Karka, his son; 3. Krishna, his son; 4. Dhruva, his son, who died at Alláhábád; 5. Govind II., son of Dhruva; 6. Indra, brother of Govinda; 7. Karka, son of Indra, the author of the grant, whose heir presumptive was Danti Varma, his brother. The date agrees with that of our dynasty, and Mr. Prinsep, by supposing Karka to be the same with Kongani, traces all the above-mentioned princes in the Chera list with the exception of Indra. Independently, however, of the difference between the names Karka and Kongani, supposing them to belong to the same person, the succession of the princes differs entirely from that given in our MSS., in which neither the kingdom of Láta, nor any of the events recorded in the grant, are noticed. Hence it seems clear that the grant must belong to a different dynasty, ruling over a country far to the north of Chera, the Láta desa being probably situated immediately south of the Nerbadda river.

	A. D.
The Fifteenth king installed	366
Nineteenth king installed in	539
Twenty-second king made a grant in	669
Twenty-third king made a grant in	746
Twenty-eighth king made two grants in	878 and 894

Reckoning from the earliest of the above dates A.D. 82, to the last A.D. 894, during which twenty-four princes are shown to have reigned, the average length of the reigns would be nearly thirty-four years each, a period longer than the settled principle of such calculations shows to be admissible. We may remark further, that two of these kings (Nos. 12 and 14) ruled only for a short time, and others, as Nos. 11 and 27 abdicated. We must, therefore, endeavour to find some well authenticated date from which we can apply the test of average duration; an approximation to, if not a correct date, seems to be presented in that of the last independent Chera prince of our list, Malla-deva Ráya II. (No. 28).

In the account of this prince, our MSS. relates the building of a temple to Vishnu in A.D. 894, and we must infer from the mention of it, that the transaction took place during the continuance of his authority, and that the Chola conquest was not effected till after that period.

We learn from the Tamil verses which give the boundaries of the kingdom, that a part of Kerala, or Malabar, was subject to the Chera sovereigns, but their authority appears to have been represented by a viceroy. These viceroys seem to have borne the title of "Cheraman Perumal," or viceroy of the Chera sovereign, in which light Mr. Ellis has regarded them[1]. The last of these viceroys revolted from his government and embraced the religion of Islam; this event evidently indicating a decline in the power of his superior happened, as Professor Wilson informs us, in the ninth century[2], and our MSS. fixes the Chola conquest at the same period, which seems thus far to be borne out.

Mention is made of the religious reformer, Sankaráchárya, in the reign of Tiru Vikrama I., the seventh prince, about A.D. 180, according to the date in our MSS; this statement would give to that reformer a much greater antiquity than is allowed by the best authorities; his era, it is true, has not been conclusively determined, though the concurrent opinion of some of the greatest Oriental scholars places him in the ninth century[1]. It may be remarked, that the MSS. represents Tiru Vikrama I. (No. 7), to have been converted to the faith of Siva by the reformer, and the succeeding monarchs appear to have been votaries of the Hindu deities, some of Siva and others of Vishnu; this would accord with the supposition of the conversion of the king having been the work of Sankaráchárya. It may not be unfair, however, to suppose that the compiler of the MSS. may have placed this reformer in the reign of Tiru Vikrama I., instead of in that of Tiru Vikrama II. (No. 18), according to the favourite practice of native authors assigning the most remote antiquity to their venerated teacher[2]. A calculation on the principle of average length of reign, reckoning back from 894 the date given in our MSS. as that of the last Chera sovereign, would place Tiru Vikrama I. in the sixth, and Tiru Vikrama II. in the eighth century.

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[1] Ellis's Mirasi Right, p. xvi.

[2] Wilson's M'Kenzie Catalogue, vol. i., Int., p. xcvii.

Assuming a period nearly corresponding with A.D. 900, as the date of the Chola conquest, we may proceed to check the dates by allowing to each prince a reign of eighteen years, the period usually adopted[3]. The number of Chera princes in our MSS. is twenty-eight[4], which multiplied by eighteen, gives us five hundred and four years, and this being deducted from A.D 900, gives the year A.D. 396, as the probable period at which this dynasty arose. The reigns of some of the kings, appearing, as before observed, to have been of short duration, it may be a question whether in this case the allowance of eighteen years is not too much; we may however look upon the year A.D. 400, or more widely the fifth century, as the time indicated by our MSS. for the rise of this dynasty; a period which has received the sanction of Professor Wilson, and in which we have proof of the existence of Chera kings, as an inscription of the Chalukya dynasty dated A.D. 490, refers to the princes of Chera along with the Chola and Pándya princes[5].

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[1] Wilson's Sanscrit Dictionary, Preface, p. xv.; Asiatic Researches, xvii., p. 177.

[2] See Buchanan's Journey, vol. i., p. 143; ii., p. 74; iii., p. 91 and 301.

[3] Ellis's Mirasi Right, p. xlvi.

[4] Professor Wilson, in his Catalogue of the M'Kenzie Collection, states the number as twenty-six, omitting No. 12, Mádhava Mahádhí Ráya, and No. 15, Kongani Mahádhi Raya II., and an unnecessary comma has been inserted in the press between Chaturbhúja and Kumara or Kanara deva (No. 4), thus making the actual number of names twenty-seven. (See Catalogue, vol. i., p. 199.) Mr. Taylor has adopted the list with its errors; (Taylor's MSS., vol. ii., p. 64;) as has also Mr. Prinsep, in his Tables, in the latter, however, Raja Malla deva (No. 24), is divided into two names, viz., Rája Deva and Malla Deva; and Malla Deva II. the last prince is entirely omitted. (Prinsep's Tables, p. 121.)

[5] Journal of Royal Asiatic Society, vol. v., p. 343.

We may now turn our attention to that part of our MSS. which relates to the conquest of Chera by the Chola monarchs, and to the history of those Chola kings who are represented as keeping the Kongu and Karnáta desas under their rule.

The great source of the difficulty that we shall encounter in our inquiry, and in comparing our MSS. with other notices of the Chola kings, arises from the indiscriminate use of names and titles. Although the Rev. Mr. Taylor questions the probability of the same king being known by more than one title, we have the authority of Professor Wilson and Mr. W. Elliott for the fact[1]; the MSS. which we are now considering furnishes frequent instances of such double titles[2], and Mr. Taylor himself, in his Analysis of the M'Kenzie MSS[3]., thus describes one of the documents. "Another list of the Chola princes is given with the explanation of the names; and showing three different names sometimes given to the same individual."

The names given to the Chola princes in our MSS., with the exception of Víra Chola and Deva Ráya, do not, as far as can be discovered, appear in any of the other lists of Chola kings[4], it would therefore seem probable that the same sovereigns must have been called by different names or titles. Professor Wilson suggests the possibility of Kulottunga and Rajendra being titles of the same person; neither of these names occur in our list, but there seems reason to suppose that Rájendra was a title of the first prince in our list, called Vijaya Ráya Aditya Varma.

With respect to Rajendra, we learn from Mr. Ellis that in the year A.D. 886, the poet Gamban presented to a king of Chola of that name, his Tamil translation of the Rámáyana[5]; the date 886, it will be observed, is only eight years anterior to the last date given by our MSS. in its annals of the Chera sovereigns; and we have the evidence of a grant to show that Rájendra ruled thirty years[6] at least. A fragment of an inscription preserved by Mr. Ellis, represents a feudatory chieftain of Rájendra ascending the throne of Tondamandalam, in the ninth year of Rájendra's reign, after "having terrified Mallen and taken his elephant and horse;" this "Mallen," Mr. Ellis considers to have been one of the Curumba princes, but adds, that if so, the event must have taken place long before the grant was written[7]; it may therefore be asked whether the "Mallen" referred to was not "Malla deva," the last of our Chera kings; the locality of this chieftain as a feudatory prince need not invalidate this supposition, for he may, before his elevation to the government of Tondamandalam, have acted as general of the Chola forces, in the conquest of Chera, in the same manner as our MSS. represents Amra Bhojángan, the Pándya general, to have done in the reign of Ari Vari deva. Camban's date does not enable us to fix that of Rájendra's accession to the Chola throne, but there are reasons for believing it to have been but a short time previous to Camban's presentation of his poem in 886, for Mr. Ellis says he finished his translation in the reign of Rájendra, while a legendary history of the translation[1], represents the author as patronized by Kerikála Chola. It cannot be now shown that Kerikála was Rájendra's immediate predecessor; one list, indeed, places Bhíma Chola[2] between them; if Camban, however, presented his poem soon after Rajendra's accession, the date supplied by that author, the date of our MSS., and the victory over "Mallen" recorded in the above-mentioned inscription, will perfectly coincide.

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[1] Wilson's M'Kenzie Catalogue, vol. i., Int. LXXXVIII., and p. 182; Journal of Royal Asiatic Society, vol. iv., p. 3.

[2] See No. 16, 17, 21, 26 and 30. [3] Appendix, p. 135.

[4] All the lists that have been obtained are given in an Appendix.

[5] Ellis's Mirasi Right, p. XLVI.

[6] Taylor's Analysis of the M'Kenzie Collection, p. 73.

[7] Ellis's Mirasi Right, p. XLV.

A list of Chola kings, given in a series of chronological tables in one of the M'Kenzie papers[3], gives the following in succession.

		Reigned years.	A. Sal.	A. D.
No. 18.	Vikrama Chola	80	749	827
19.	Kulottunga Chola	40	789	867
20.	Rájendra Chola	60	849	927
21.	Víra Chola	50	899	977
22	Vishnu Varma, or Vishnu Bellala	41	940	1018
23.	Deva Bellala, or Deva Pullan	40	980	1058
24.	Hrudia? Pullan	40	1020	1098

In speaking of Rájendra, this MSS. refers to Camban's presentation of his poem in A.D. 886, thus offering corroborative proof of the time of Rájendra's reign. We find also three of the above names in the same order, in "a poetical account of the actions of Vikrama, Kulottunga and Rájendra Chola[4]," which shows that so far this succession was received by other Hindu authors.

But whatever weight may be attached to the foregoing observations, there are other reasons for believing that Rájendra was the conqueror of Chera, and also for upholding as correct the era assigned to him. Professor Wilson says, "Rájendra Chola appears to have been a very distinguished member of the dynasty, and his inscriptions describe him as victor over the Pándyan and Chera princes and those of Utkala and Virát. He is said even to have undertaken maritime aggressions, and embarking on board ship to have subdued Yelanki, or Ceylon, Kalinga, or the northern part of the Coromandel coast, Gaur and Bengal. These are no doubt exaggerations, but they leave it likely that Rájendra was a prince of more power than any Chola monarch could have enjoyed after the Yádava and Bellála Rajas had the ascendancy, and this consideration confirms his living in the ninth century[1]." The short notice of Vijaya Ráya Aditya in our MSS., might appear inconsistent with the character of a great conqueror exhibited in the foregoing quotation, but allowing for possible exaggeration in the latter, the differences will be found to consist rather in omissions than in contradictions, for notwithstanding the meagreness of the information supplied by our MSS. with respect to the Chola conqueror of Chera, it is clear that he must have been a very powerful prince, though all that the compiler seems to have deemed worthy of mention, is the conquest of Chera and Karnáta, and the charitable grants made there, holding all other conquests of this prince unworthy of notice in an account of Chera. At any rate the omission cannot be deemed to contradict the inscriptions, nor to disprove the identity of Rájendra and Vijaya Ráya Aditya, whose date, and consequently that of the subjugation of Chera by the Chola monarchs, may therefore be readily admitted to have been the end of the ninth century.

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[1] Wilson's M'Kenzie Catalogue, vol. i., p. 163.

[2] Appendix, No. 5.

[3] "Varalar, &c.," in Wilson's M'Kenzie Catalogue, vol. ii. CLVI., No. 24. See Appendix, No. iii.

[4] Wilson's M'Kenzie Catalogue, vol. i., p. 196.

Of Víra Chola or Víra Chola Náráyana (No. 30 in our MSS.), we have a grant dated in the ninth year of his reign, in which he is styled Víra Chola Víra Náráyana, thus confirming the statement of our MSS. with respect to his title, "that, being a zealous follower of Vishnu, he was called Náráyana." Of the two following kings, namely, Dásoditya and Parandaka, no traces can be elsewhere discovered; we have a grant dated in the twentieth year of "Deva Rája Chola," which name is no doubt identical with the Divya Ráya of our MSS. (No. 32).[2]

Mr. Ellis presents us with a grant of "Tribhúvana Víra Deva Chola," whom he states, "following a tolerably correct list of the Chola kings," to have been the thirty-eighth prince of the line, and fifth in succession fromRájendra; of this Tribhúvana Víra Deva Chola there are many other grants extant in the M'Kenzie Collection of inscriptions. This grant has been assigned to "Víra Chola[3]" (No. 30), but there seems to be good reason for giving it to Ari Vari deva (No. 34). It must be observed, that the thirtieth king is called in our list Víra Chola and Víra Chola Náráyana, and as before-mentioned we have notice of a grant in which he is known by the latter title; the word "deva" nowhere occurs in connection with his name; but in Ari Vari *deva* we have it distinctly, the name Ari Vari being possibly a different appellation, or a wrong rendering of "Hari Víra." This grant of Tribhúvana Víra-deva Chola informs us, that he "triumphed over the crowned head of Pándya," this could hardly apply to the Víra Chola (No. 30) of our list, for it may be inferred from the remark of our MSS., which says, "he and the Pándya Rája both conquered many desas," that Víra Chola was in alliance with the Pándya king; the statement, however, is perfectly applicable to Ari Vari deva. The Víra deva of the grant, was according to Mr. Ellis, fifth in succession from Rájendra, and Ari Vari deva is in our MSS. fifth in succession from Vijaya Ráya Aditya, whom we have endeavoured to identify with Rájendra. If the list upon which Mr. Ellis stated that Víra deva was the fifth prince after Rájendra be correct, the date of the grant will also agree with the era of Ari Vari deva; it is dated in the thirty-seventh year of the reign, and Mr. Ellis, reckoning at the rate of eighteen years for each of the four kings intervening between Rájendra and Víra deva, and adding the total to A.D. 886, the date of Rájendra as given by Camban, places Víra deva's accession in A.D. 958; adding to that thirty-seven years for the grant, we arrive at A.D. 995. In this calculation, Mr. Ellis has allowed no time to Rájendra after Camban's presentation of his poem in 886, but as we have evidence from a grant that Rájendra reigned thirty years, and as Camban appears, as before observed, to have presented his poem shortly after Rájendra's accession to the Chola throne, it will not be unreasonable that, placing the time which Rájendra may be supposed to have reigned after the grant, dated in the thirtieth year of his reign, against that which had elapsed before the date given by Camban, we should add the whole thirty years of Rájendra's grant to this calculation, which will bring us down to 1025; and Ari Vari Deva, as will be presently shown, died in 1058.

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[1] Wilson's M'Kenzie Catalogue, p. LXXXVIII.

[2] MSS. at East India House.

[3] Ib., vol. i., p 181.

Two important inscriptions of the Chalukya dynasty, procured by Mr. Walter Elliot, and described in the Society's Journal[1], throw some light upon the portion of our MSS. which relates to Ari Vari deva. These inscriptions are dated Sal. 981 and 993 (A.D. 1059 and 1071); the first is a grant by the Chalukya sovereign, Someswara I., who is styled "the Narendra of the Chola race," of some lands at Savanur to his general upon the latter's returning from a successful attack upon the Chola kingdom; the general is styled the humbler, among other persons and places, of Bhujánga. The second inscription, which explains the reason of the attack upon the Chola dominions, mentioned in the first inscription, is a grant to a new temple at Pulikara nagara, now Lakmeswara; the former temple is said to have been destroyed along with many other Jaina temples, by "the outcast Pandi Chol, who had forsaken his usual course, and left off practising the virtue of his race," in an invasion which he made upon the Belavel desa, or level lands of Karnáta, belonging to the Chalukya monarch; it also informs us, that he was afterwards defeated and killed by the Chalukya forces. This attack upon the Chalukya dominions, is evidently part of the expedition which our MSS. attributes to Ari Vari deva, and the Bhujánga, who was conquered, is clearly the Amra Bhojánga of our MSS. general of the Chola forces, who is stated to have come over to that king from the Pándya ruler; this circumstance, and the amity which existed in the latter part of Ari Vari's reign between the Pándya and Chola kings, may have led to the latter being called in the above cited inscription "Pandi Chol." The Chola monarch who was killed, appears from the inscriptions to have been he who made the attack, and as the inscription which first records the victory is dated 1059, we must place the death of Ari Vari deva in A.D. 1058. Our MSS. assigns no reason for not continuing the history of the Chola kings after Ari Vari deva, but commences immediately upon the Bellála dynasty; the loss of the Chera and Karnáta desas, was undoubtedly the cause of this cessation in its notice of the Chola Rájas, and these inscriptions satisfactorily account for the loss.

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[1] Vol. iv., p. 13.

Our MSS. mentions a grant by Ari Vari deva in A.D. 1004, which would show him to have reigned fifty-four years, if we are right in placing his death in 1058; his reign, as shown by the grant of "Víra deva," and the magnitude of his expeditions, must certainly have been a long one.

Considering then the year A.D. 1058, as conclusively determined to be that of Ari Vari's death, we may endeavour to measure the others by it, with the view to ascertain the time of the conquest of Chera by the Chola kings; reckoning backwards from A.D. 1058, and allowing

	Years.
To Víra deva (Ari Vari deva) according to his grant .	37
To Divya Ráya from his grant	20
To Rájendra according to his grant thirty years after Camban's date 886, leaving for his reign after A.D. 900 .	16
And eighteen years to each of the other three kings .	54
Total	127

This total being deducted from 1058, leaves A.D. 931 as the date of the conquest. But when we consider that in the above calculation we have allowed to two of the kings (viz., Ari Vari deva and Divya Ráya), no time after the dates of their grants, though the former is supposed to have reigned fifty-four years; and further, when the adjustment of points so corroborated, rests on average calculation, and we refer to the length of reign assigned by the chronological list, quoted from the M'Kenzie MSS. to three of the above kings (viz., Rájendra, Víra Chola, and Divya Ráya); we may without much risk allow the thirty-one years to be distributed among the six kings, and thus place the conquest in A.D. 900. Such an addition, although it would make the average duration of their reigns above that which is usual, will, nevertheless, not render it extravagant nor unparalleled. The reigns of the Bellála kings give, upon the whole, an average of nearly thirty years to a reign.

Our MSS. informs us, that Víra Chola (No. 30), conquered the Rajah of Ceylon; and Mr. Ellis's grant says, that Víra deva Chola (or, as we suppose, Ari Vari deva No. 34), triumphed over "Madura, Izham, Caruvúr and the crowned head of Pándyan:" Izham being a Tamil name of Ceylon. Various attacks upon Ceylon are recorded in the Bauddha annals of the island, as given to us by the Hon. G. Turnour, in his "Epitome of the History of Ceylon;" in this work, one invasion by the Chola forces is placed about A.D. 990, and another in A.D. 1059; but the very scanty notice which our MSS. supplies upon this point, does not enable us to decide satisfactorily when, and by whom, these invasions were made; we may however readily admit that expeditions against Ceylon were undertaken by one or more of the Chola monarchs recorded in our MSS.

FROM the preceding notices we learn with tolerable certainty, that a race of kings ruled the country of Chera from a very early age, and during several centuries; that though the earliest date to which we can consistently trace the recorded dynasty be the fourth or fifth century, we learn from Ptolemy that the kingdom had existence in the first; and the appellation of Vedar Rajas, or huntsmen, given in our MSS. to the line whose last monarch was vanquished by the Chola king, Vijaya Ráya Aditya Varma, would suggest that although the royal annals do not go so far back, the dynasty who were extinguished by the Chola monarchs in the tenth century, were a race of aboriginal princes who ruled the country before the invasions from the north. That at no very advanced period they added a considerable portion of ancient Karnáta to their dominions, and resided at Tálakád in that desa-

That about the year A.D. 900, or a little later, their possessions were conquered and annexed to the Chola dominions, under which dynasty they continued for upwards of a century until A.D. 1058. That the Chola princes must, during the subjugation of these countries to their rule, have been very powerful; their neighbour, the Pándya king, appears to have held his throne towards the end of the period, most probably as a tributary prince. That they undertook maritime aggressions upon the island of Ceylon, and that they carried their arms a considerable distance to the northward of Chola, is clear from the Chalukya inscriptions, which represent them as destroying the Jaina temples at Lakmeswar[1]. Their attack upon the dominions of the Chalukya princes professing the Jaina faith, and the destruction of the Jaina temples, appears to have aroused both political and religious feelings against them, and to have led to an attack upon them by the Chalukya dynasty, which ended in the death of the Chola king, and the loss of those districts which form the subject of the present paper. The cessation of any notice in our MSS. of the Chola monarchs after Ari Vari deva is sufficient to satisfy us that he was the last Chola king who governed the Chera and Karnáta desas; and the Chalukya inscriptions clearly point out the reason for the loss of those countries, which our MSS. had left unexplained.

The confusion which must necessarily have followed such a signal victory as the Chalukya inscriptions commemorate, led to a total disregard of any superior power by the chieftains of the Chera and Karnáta desas; for the continuation of our MSS. informs us, that those provinces were in the "possession of Poligars, who lately were paying tribute to the Chola Rajas:" such a state of things was not likely nor destined to last long, for a dynasty arose from the anarchy, which ruled the centre of the peninsula for two centuries and upwards; this was the Bellála or Hoyisála dynasty, the founder of which appears to have established himself at Tálakád, and although considerable opposition would seem to have been given to him, his power became pretty firmly established in a few years, for we have a grant of this dynasty dated A.D. 1069[2]. Karnáta and part of the Chera desa were the chief possessions of this line of princes.

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[1] Lakmeswar is a little to the south-west of Dharwar, in the southern Mahratta country.

[2] Wilson's M'Kenzie Catalogue, vol. i., Int. p. cix.

APPENDIX.

NOTE.—*In the following lists the original orthography has been retained.*

1. List of Chera Kings from "The Vamsavali, or Genealogical Account of the Dynasties of the Chola, the Chera, and the Pandya Kings." Wilson's M'Kenzie Catalogue, vol. ii., p. cxxviii., No. 1.

It gives first a list of thirty rajas who lived in the first ages of the world, and then the following list of those who reigned in the Kali age.

1. Austaya Pauttora Cheran.
2. Yanauthe Pauttora Cheran.
3. Vamsa Paripaulaka Pauttora Cheran.
4. Mungalakauma Pauttora Cheran.
5. Seevadurma Mottark.
6. Seelana.
7. Seevapava.
8. Sindoo Lauraneya.
9. Yalavajana Sumrastaka.
10. Teerka Yauttaura.
11. Teerta Chatta Cheran.
12. Auchoota Pratapa.
13. Aucondita Creety Pratapa.
14. Vira Rajendra.
15. Bhimeswara.
16. Neroomala Sakara.
17. Punjaustara.
18. Jeeva Pautaka.
19. Tiroomunja.
20. Kylasatta Audunga.

2. List of Chola Kings from the same paper; forty-eight ruled before the Kali age, and the following eighteen after.

1. Poonderick Cholan.
2. Neelama Chamala vurna.
3. Daunavaraury.
4. Bhoopaurum Titta.
5. Poovel Vunda.
6. Punna Sabiya Cara.
7. Pauracoorumma.
8. Manoomeely Yetta.
9. Chuntra Cooladhi.
10. Sansara Soodamany Cholan.
11. Nauga logam Conda.
12. Audakeswara.
13. Cuncaupautarumen.
14. Cuncoodaumany.
15. Woottoorocau.
16. Sattooroo Staya.
17. Creemeecutta.
18. Caunpraya.

3. List of Chola Kings from a "Varalar, or Chronological Account of the Kings of the Kali Yug." Wilson's M'Kenzie Catalogue, vol. ii., p. clvi., No. 24.

		Reign.	Sal.
1.	Kerikala		
2.	Mandurantaka		
3.	Poowa Chola		
4.	Pedda Chola .	7	56
5.	Siddi Bhoopala .	21	77
6.	Toyabeema .	30	107
7.	Tommasiddoo .		112 to 178

	Reign.	Sal.
8. Teranda Cholan	20	198
9. Keleganda	21	219
10. Chinna Pellan	40	259
11. Matwa Maha Raja	40	299
12. Deva Chola	60	359
13. Mumedy ganda Chola, alias Trigasy Raja	50	409
14. Raja Caseree	70	479
15. Cheren Chola	80	559
16. Pudma Caseree	50	609
17. Rajadi Raja	60	669
18. Vikrama	80	749
19. Culottunga	40	789
20. Rajendra (son-in-law)	60	849
21. Vira Chola	50	899
22. Vishnu Varma, or Vishnu Bellala	41	940
23. Deva Bellala, or Pullan	40	980
24. Hrudia Pullan	40	1020
25. Jayasinha	51	1071
26. Chundrasinha	38	1109
27. Neelakunta	40	1109

"Then commenced the Rayars."

4. List of Chola Rájas procured from a village Accountant, by Mr. Buchanan. Buchanan's Journey, vol. iii., p. 472. Prinsep's Tables, No. xl., p. 119.

1. Utinga Sholun.
2. Culatunga Sholun.
3. Rajendra Sholun.
4. Tiramudi Canda Sholun.
5. Carical Sholun.
6. Arundavan Sholun.
7. Womyuru Sholun.
8. Shayngun Sholun.
9. Munalinda Sholun.
10. Mavanedi Canda Sholun.
11. Vacula Sholun.
12. Alaperinda Sholun.
13. Tiraveratu Sholun.
14. Arleunu Cadama Canday Sholun.
15. Jeyum Canda Sholun.
16. Kirimi Canda Sholun.
17. Toudaman Sholun.
18. Buddum Cuttum Sholun.
19. Shomuman Sholun.
20. Ghingui Conda Sholun.
21. Sundra Pandia Sholun.
22. Pottapu Sholun.
23. Shingu Wullanda Sholun.
24. Deva Sholun.
25. Shaynahutti Sholun.
26. Vira Sholun.
27. Shayngaru Sholun.

"Total of the Sholun Rajas 27, who reigned 534 years."

5. From the Chola Mahatmya. Wilson's M'Kenzie Collection, vol. i., p. 181. Prinsep's Tables, xliii., p. 121[1].

	Reigned.
1. Kulotunga	90
2. Deva Chola	60
3. Sasisekhara	70
4. Siva linga	87

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[1] The years of their reigns are added from a MSS. translation of the original document. Wilson's M'Kenzie Catalogue, vol. ii., p. cxxviii. No. 14.

	Reigned.
5. Víra	87
6. Kerikála	90
7. Bhíma	70
8. Rájarájendra	78
9. Viramártanda	66
10. Kírttivarddhana	77
11. Vijaya	60
12. Kanaka	70
13. Sundara	60
14. Kalakala	70
15. Kalyána	54
16. Bhadra	70

6. The "Chola desa Púrvika Cheritra," Wilson's Catalogue, vol. i., p. 187, says there were forty-four princes, but does not give them. It makes Kulottunga the last of the forty-four, and a contemporary of Kamban. The list of sixteen is noticed, and a Pattira Chola is given as the last prince of that line.

7. Chola Kings mentioned in the "Supplementary MSS." Taylor's Historical MSS., vol. i., p. 197.

Parakirama Soren, reigned thirty years.
Kulottunga, his son, forty years.
Panjala, his son, thirty-five years.
Loga retshaga, his son, thirty years.

The first obtained Chola by conquest from Pandya, the last lost it again.

8. Princes mentioned in the "Madura Sthala puranam." Taylor's Historical MSS., vol. i., p. 73, 80, 96; ii. p. 69.

Kerikala, contemporary with Rajasekhara Pándyan.
Kadu Vettiya, contemporary with Kulopushana and Rajendra Pándyan.
Vikrama, contemporary with Vamsa Sekhara Pándyan.

9. Taylor's Analysis of the M'Kenzie Collection, p. 130. From "An Account of the Chola Rajas."

Vayal Varzi Aditta Cholan.
Suba Cholan.
Varaguna Cholan.
Pugerh Cholan.
Kribala Cholan.
Vithi Vidangam, entitled Bhúpála Cholan, or Cari Canda Cholan.

10. From the "Appendix to Taylor's Analysis," p. 135.

Uttunga Cholan.
Kulottunga Cholan.
Tirumudi Cholan.
Aruntapa Cholan.
Rajendra Cholan.
Manunithi Cholan.
Ala peranta Cholan.
Vara-guna Cholan.
Ala peranta Cholan.
Ariloru kadamai kondai Cholan.
Anantana Cholan.
Cadu-vetti Cholan.

11. Another list of twenty-three kings is mentioned in Taylor's Analysis, p. 135, but not given; the last of the race is said to have been Cari Cala Cholan.

12. List of Chola Rajas, from "The Rajas of the Four Ages." Wilson's M'Kenzie Catalogue, vol. ii., p. cxxix., No. 28.

		Reigned.			Reigned.
1.	Rajendra	71	10.	Swarna Chola	20
2.	Madava Miduna	31	11.	Vootoonga	21
3.	Pandava Chol	60	12.	Teeranoota	21
4.	Vira Chol	51	13.	Tarenda	41
5.	Deva Chola	29	14.	Teeroomaragunda	19
6.	Chenneea	40	15.	Marconda	45
7.	Voow Pandia	30	16.	Vorayoor	20
8.	Culottunga	41	17.	Caricall	41
9.	Tondaman Chakravarti	60	18.	Raja Cholan	53

ART. II.—*On the Rock-Cut Temples of India, by* JAMES FERGUSSON, ESQ.

Read, December 5, 1843.

THERE are few objects of antiquarian research that have attracted more attention from the learned in Europe, than the history and purposes of the Cave Temples of India, but if we except the still unexplained antiquities of Mexico, I know none regarding which so little that is satisfactory has been elicited, or about which so many, and such discordant opinions exist: and while the age of every building of Greece and Rome is known with the utmost precision, and the dates of even the Egyptian monuments ascertained with almost as much certainty as those of mediæval cathedrals, still all in India is darkness and uncertainty, and there is scarcely a work on architecture published, or lecture read, which does not commence by a comparison between the styles of India and Egypt, and after pointing out a similarity which seems to be an established point of faith in Europe, though in reality no two styles are more discordant, the author generally proceeds to doubt which is the more ancient of the two, and in most cases ascribes the palm of antiquity to the Indian as the prototype. Yet, in truth, Egypt had ceased to be a Nation before the earliest of the cave temples was excavated, and if we except the copies of earlier structures erected by the Ptolemies and Cæsars, there is nothing on the banks of the Nile which does not belong to a different and far more ancient epoch than anything in India.

Had Mr. James Prinsep lived to continue for a few years longer the researches which he commenced, and continued with such success, he probably would have succeeded in raising the veil which still shrouds in obscurity the antiquities of India; and though he has done much, and perhaps more than any one who preceded him, he was called away before his work was complete, and no one in India has since attempted to follow up the task he had proposed to himself. The spirit and enthusiasm he infused into all around him has died with him, and the subject of Indian antiquities relapsed into the former state of hopeless neglect.

The only attempt I am aware of to do any thing to follow up Mr. Prinsep's discoveries is that of Dr. Bird, of Bombay, who, while the spirit was strong in India, commenced the task of copying all the inscriptions in the cave temples on his side of India, and getting drawings made by some Portuguese assistants he had, of their architecture. When I was in Bombay in 1839, his work was in the press, and believing that it would soon be published, and that his testimony on the subject would be more valuable than mine, and probably sufficient to satisfy curiosity, I abandoned the idea of publishing my views on the subject; but when I revisited Bombay in the spring of the present year I found the work still in the press, and with apparently about the same chance of its being published now, as there was four years ago. I have been therefore induced to put the following remarks on paper, believing the subject to be one that could scarcely fail to be of interest to the Society. And I do this not with any idea of anticipating or forestalling Dr. Bird's work to which I would willingly give precedence if I saw any chance of its being published; but, because, as I believe our modes of research to have been totally different, the one may throw light on the other, and if I am not mistaken in what he told me of his work, they cannot interfere. *His* conclusions are drawn principally from the inscriptions and written authorities, while mine have been arrived at almost entirely from a critical survey of the whole series, and a careful comparison of one cave with another, and with the different structural buildings in their neighbourhood, the dates of which are, at least approximatively known. A combination of both these methods of research is necessary to settle any point definitely; but the inscriptions will not certainly by themselves answer that purpose, for in many instances they were cut long subsequent to the ascertained date of the cave, as in the Ganesa Gumpha[1], at Cuttack; and I have also reason to suspect, that, in some instances at least, the Buddhists affected an older character as more sacred, as we sometimes use old English letters in modern inscriptions. Unless, therefore, they contain names that can be identified in some of the lists we possess, or dates, the inferences they lead to, cannot in all cases be relied upon; and except the Behar caves I am not aware of any, where the names have been at all satisfactorily identified; and I do not know of any single cave inscription bearing a date from an ascertained era. Still the inscriptions form a most essential part of the inquiry, but one that I had neither leisure nor learning sufficient to devote myself to; and though I must consequently admit the imperfection of my labours from this cause, I had other advantages for prosecuting the inquiry that have fallen to the lot of few; for in the various journeys I undertook I was enabled to visit almost all the rock-cut Temples of India, from those of Cuttack and Mahavellipore[1] on the east coast, to those of Ellora and Salsette on the western side; and there are few buildings or cities of importance in India which I have not at one time or other been able to visit and examine. I had besides the advantage, that as all my journies were undertaken for the sole purpose of antiquarian research, I was enabled to devote my whole and undivided attention to the subject, and all my notes and sketches were made with only one object in view, that of ascertaining the age and object of these hitherto mysterious structures. Whereas, most of those who have hitherto written on the subject, though drawing and writing better than I can pretend to do, have only visited the caves and temples incidentally while travelling on other avocations; and none that I know of, have been able to embrace so extensive a field of research as I have.

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[1] Gumpha, is the local designation for a cave at Cuttack; gurbha or garbha, would I believe be more correct.

I hope, therefore, it will be understood, that the following remarks are not offered as the result of much learning or deep research, but simply as the practical experience of an architect in a favorite branch of his study.

In a short paper as the present is intended to be, it will be impossible to enter into all the arguments that may be urged for and against the various disputed points of Indian and Buddhist chronology; and though I am aware that I may often appear dogmatical in stating my conclusions, without adducing the reasoning from which they have been arrived at, I do not think I can be too concise, at least, in the first instance, and if any point appears to be of sufficient interest to the Society, I can afterwards add more detail than my limits at present admit of. I shall at the same time try to avoid, as much as possible, all hypothetical matter, and state merely what bears directly on the subject under consideration, and that as succinctly as possible; and I shall be less tempted to digress, as I have for some time past intended publishing a series of views, illustrative of this subject, accompanied by a volume of letter-press, in which I shall have abundant opportunity of stating all these views at length. That I may, however, be understood in the following remarks, I will state here the principal conclusions I have arrived at regarding the religion of India, without entering on the grounds on which they were formed, or the reasoning by which they are supported.

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[1] There are various ways of spelling and pronouncing the name of this place. The most popular, and the one by which it is generally known in Europe, is Mahabalipooram, "The city of the great Bali;" but which is now generally allowed to be incorrect, though adopted with a slight variation of spelling by Messrs. Chamber and Goldingham. Mr. Babington calls it Mahamalaipur, "The city of the great mountain," having found it so called in a Tamul inscription there.

Locally, it is called Mahavellipore, Maveliveram, Mailurum, &c. I have throughout this paper adopted the first, as most resembling its popular name, without pretending to any etymological correctness, or to any hypothesis regarding its origin or history.

The first is, That prior to the advent of the present Buddha, a Brahmanical religion existed in the country, a deistical fire-worship, very unlike the present religion bearing that name. That contemporary with this a Buddhistical religion also existed, differing but little from the other, probably two forms of the same religion. The former has entirely perished, and Buddhism, as we now know it, owes its origin to Gotama Buddha, the son of Suddodana; and was either an entirely new form given to the pre-existing religions, or what is more probable, a reform of both, meant probably to amalgamate the two. It could not however have differed much from the Brahmanism of those days, as we find the kings and people changing backwards and forwards, from one to the other, without difficulty or excitement; and in the description of the Greeks and in native records, we often find it difficult to distinguish between the one and the other.

2nd. It appears also certain that the correct date for Sakya Buddha obtaining Nirvana was 543 B.C. The principal authority opposed to this date are the trans-Himalayan chronologies, which generally concur in placing him about five hundred years earlier. They, however, contain their own refutation, (though I have never observed it pointed out,) inasmuch as they all place the event in the reign of Ajatasatta, and place Asoka little more than one hundred years after. Whereas, the date of the latter is perfectly ascertained to be about 250 B.C.; and of the former, not many years from when the Ceylonese authorities place it.

3rd. That from the time of Asoka till the destruction of the Andhra dynasty of Magadha in the beginning of the fifth century, Buddhism was the principal religion in the north of India, though in the south it never seems to have obtained a permanent footing, where the Brahmanical religion still prevailed, and during the time of Buddhist supremacy in the north, that form of it was elaborated which flowing back on the parent country exists in the form we now find it.

With regard to the antiquity of the monuments, all that is here necessary to state is, that the oldest relics of whose existence I am aware are the Laths, bearing the inscriptions of Asoka, dating from the middle of the third century B.C. I am not aware of the existence of any cave anterior to, or even coeval with these, nor of any structural building whose date can reach so high as the first centuries of our era.

I may also state that it appears quite evident that the Buddhists were the earliest cave diggers, and that it is not difficult to trace the connection of the whole series from "the earliest abode of Bauddha ascetics" at Nagarjuni, to the Kylas at Ellora; but as the principal object of the present paper is to point out this connection, I will not enlarge upon it more in this place; but in order to be understood, I must, before proceeding to describe particular caves, say a few words on the subject generally, to point out the different classes into which they are divided, and consequently, explain the names I shall apply to them throughout.

As far as my knowledge of the cave temples of India extends, the whole may be classified under the following heads.

First, Vihara, or Monastery Caves.

1st, The first subdivision of this class consists of natural caverns or caves slightly improved by art; they are as might be assumed the most ancient, and are only found appropriated to religious purposes in the older series of Behar and Cuttack; and though some are found among the western caves, their existence there appears to be quite accidental.

The second subdivision consists of a verandah, opening behind into cells for the abode of the priests, but without sanctuaries or images of any sort. The simplest form of this class consists of merely one square cell with a porch, several instances of which occur in the Cuttack series; sometimes the cell is nearly thirty feet long, as in the Ganesa Gumpha, of which a plan is herewith[1]; and at Ajunta in the oldest Vihara there, the arrangement is further extended by the verandah opening into a square hall, on three sides of which the cells are situated.

In the third subdivision of the Vihara caves, the last arrangement is further extended by the enlargement of the hall, and the consequent necessity of its centre being supported by pillars; and in this division besides the cells that surround the hall, there is always a deep recess facing the entrance, in which is generally placed a statue of Buddha with his usual attendants, thus fitting the cave to become not only an abode for the priests, but also a place of worship[2]. At Baug, the statue of Buddha is replaced by the Daghopa; but this is I believe a solitary instance of its existence in a Vihara cave.

To this division belongs by far the greatest number of Buddhist excavations. The most splendid of them are those at Ajunta; though the Dherwarra, at Ellora, is also fine; and there are also some good specimens at Salsette, and I believe Junír.

[1] Plate No. 1.

[2] Plate No. 2.

The Second class consists of Buddhist Chaitya Caves[1].

These are the temples, or if I may use the expression, the churches of the series, and one or more of them is attached to every set of caves in the west of India, though none exist in the eastern side.

Unlike the Viharas, the plan and arrangement of all these caves is exactly the same; and though the details and sculpture vary with the age in which they were executed, some strong religious feeling seems to have attached the Buddhists to one particular form for their places of worship.

In the Viharas, we can trace the progress from the simple cavern to the perfect monastery, but these seem at once to have sprung to perfection, and the Karli cave, which is the most perfect, is, I believe, also the oldest in India. Had the style been gradually elaborated in the rock, from the imperishable nature of such monuments we could not fail to have discovered the earlier attempts; but besides this, there are many reasons that I shall notice in the proper place, which lead me to suppose that they are copies of the interior of structural buildings; and it is not one of the least singular circumstances attached to their history, that no trace of such buildings exists in India, nor, I believe, in Ceylon, nor in the Buddhist countries beyond the Ganges.

All these caves consist of an external porch, or music gallery, an internal gallery over the entrance, a centre aisle which I will call the nave, (from its resemblance to what bears that name in our churches,) which is always at least twice the length of its breadth, and is roofed by a plain waggon vault; to this is added, a semi-dome terminating the nave, under the centre of which always stands a Daghopa or Chaitya.

A narrow aisle always surrounds the whole interior, separated from the nave by a range of massive columns. The aisle is generally flat-roofed, though sometimes in the earlier examples it is covered by a semi-vault.

In the oldest temples the Daghopa consists of a plain circular drum, surmounted by a hemispherical dome crowned by a Tee, which supported the umbrella of state. In the earlier examples this was in wood, and as a general rule it may be asserted, that in these all the parts that would be constructed in wood in a structural building, are in wood in the caves; but in the more modern caves all those parts, such as the music gallery outside, the ribs of the roof, the ornaments of the Daghopa, the umbrella of state, &c., are repeated in the rock, though the same forms are preserved. In front of the more modern

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[1] Plate No. 3.

Daghopas there is always a sculptural niche containing a figure of Buddha with his attendants; this may have existed in wood in the more ancient, and consequently have disappeared, but I am rather inclined to think it is a modern innovation.

These two classes comprehend all the Buddhist caves in India.

The Third class consists of Brahmanical *caves*, properly so called[1].

In form many of them are copies of, and all a good deal resemble the Buddhist Vihara, so much so as at first sight to lead to the supposition that they are appropriations of Buddhist caves to Brahmanical purposes. On a more intimate acquaintance however with them, many points of distinction are observed. The arrangement of the pillars, and the position of the sanctuary, is in no instance the same as in a Vihara; they are never surrounded by cells, as all Viharas are, and their walls are invariably covered, or meant to be, with sculpture; while the Viharas are almost as invariably decorated by painting, except the sanctuary. The subjects of the sculpture of course always set the question at rest.

The finest specimens of this class are at Ellora and Elephanta, though some good ones exist also on the Island of Salsette, and at Mahavellipore.

The Fourth class consists of rock-cut Models of structural Brahmanical temples, or, as I will call them, "Pseudo-structural temples." To this class belong the far-famed Kylas at Ellora, the Sivite temple at Doomnar, and the Ruths at Mahavellipore. Except the last, which are cut out of isolated blocks of granite, these temples possess the irremediable defects of standing in pits, which prevents them being properly seen, and the side of which being of course higher than the temples, crushes them and gives them an insignificant appearance; and though they are not the least interesting, they are in worse taste and worse grammar than any of the preceding ones.

The Indra Subha group at Ellora should perhaps form a Fifth class, as it cannot in strictness be brought under any of the above heads; but it is difficult to decide whether they are Brahmanical or Jaina; if the former, they belong to the third class, if the latter, they must be classed with what in reality form the

Fifth class, or true Jaina caves, which, without this splendid auxiliary are few and insignificant, though there are some tolerable ones at Khandagiri in Cuttack, and in the southern parts of India; and in the rock of the fort at Gualior, there are a number of colossal figures of one or the other of the Thirthankars cut in the rock, with sometimes, though not always, a small screen left before them, which thus forms a small chamber. Some of them are sitting, some standing, and many of colossal dimensions, from thirty to forty feet high; the whole however is of rude bad sculpture, and the date about, or rather subsequent to the eleventh or twelfth century of the Christian era.

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[1] Plate No. 4.

Before proceeding to describe particular caves, I may also mention here, that in speaking of Buddhist Chaitya caves, I have used terms borrowed from the names given by antiquarians to the different parts of Christian churches, because in form and arrangement they so exactly resemble the choirs, more particularly of the Norman churches of the eleventh and twelfth centuries, that no confusion can arise from my doing so, and I know not where to look for other terms, that would apply to them, and be intelligible.

In speaking of Hindu temples, as Ram Raz[1] is the only person who has attempted to describe and define the different parts of Hindu architecture, I have used his name, Vimana, to describe the principal tower, or pyramid, or spire, that surmounts the Garbhagriha, or sanctuary, in which the idol or object of worship is placed. In Hindustan, it is usually called Dewal, or Bara, or Bura Dewal, to distinguish it from the former, which is commonly applied to the whole temple. The pyramidal part is called Sikra or Surra, more commonly the former.

The porch which always stands in front of the Vimana, I have also followed Ram Raz in calling Mantapa, though locally it is called Bogha Mandap, Munduf, Muntapum, &c.

Other names of less frequent occurrence will be explained, if necessary, as they occur.

The first series of caves I will mention are those in Behar, which I have not myself seen, as from the descriptions I had read of them I knew that they possessed no great architectural magnificence, and I was not aware, till too late, that these were perhaps some of the oldest caves in India; and their locality, too, in the very birth-place of Buddhism, gives them an interest which no other series possesses, and which certainly would have led me to visit them, had I been as fully aware of it then, as I have since become; for situated in the immediate neighbourhood of Rajagriha, the capital of India at the time of Buddha's death, and where the first convocation was held, and in the neighbourhood of the capital of Asoka[2], they occupy the locality from which

[1] Essay on the Architecture of the Hindûs, 4to. London, 1834.

[2] Mahawanso, pp. 22 and 23.

we might expect more of interest than from any series in India. To the artist, however, they are the least so of any, and were it not for the inscriptions on the Milkmaid's and other caves would be almost equally uninteresting to the antiquary. The cause of this I believe exists, to a certain extent, in the unfavourable nature of the rock in which they are cut, being a long low hill, consisting of large blocks of granite without any continuous rock. But more is, I am inclined to think, owing to these being the first attempts at cave architecture, and to the simplicity which is a distinguishing characteristic of all the earlier caves. It is in the northern arm of this hill that are situated two small vaulted caves, the first ten feet wide by fifteen long, and nine feet high, and the other about the same dimensions. In the inside they are partially polished, but without any architectural mouldings on them. It is on these caves that were found the two inscriptions in the Lath character, deciphered by Mr. Prinsep, in the sixth volume of the Journal of the Asiatic Society of Bengal, as follows:—

"The Brahman girl's cave (and the Milkmaid cave respectively), excavated by the hands of the most devoted sect of Bauddha ascetics for the purpose of a secluded residence, was appointed their habitation in perpetuity by Dasaratha, the beloved of the gods, immediately on his ascending the throne."

The character in which these inscriptions are written, evidently points to an era not distant from Asoka, and if the prince there mentioned is the Dasaratha, the grandson of that king, which I see no reason to doubt his being, we have at least two caves with an ascertained date, viz., about 200 B.C., and with the purpose for which they excavated explained.

As far as our researches have yet gone these are the most ancient caves in India; and I know of no other caves which from their locality, their form, or their inscriptions, can compete with them in this respect.

The other caves of this series are situated at some little distance from the above in the southern arm of the same hill, and though of greater extent, are generally as devoid of architectural ornament as those above described. It is therefore only to their inscriptions that we can look for materials to ascertain their dates or uses.

They consist of the Nagarjuni and Heft Kaneh, or Satghur group.

They have been described, first by Harington, in the first volume of the Asiatic Researches, and by Hamilton, in his Statistics of Behar.

The first contains the inscription first deciphered by Mr. Wilkins, and published with Mr. Harington's description, and which was revised by Mr. Prinsep in August, 1837.

After an invocation to Devi, it contains an inflated account of the virtues and great qualities of the king Yajna Verma, his son Sardula Verma, and his grandson Ananta Verma, who consecrated to this goddess (Devi) the beautiful village of Davidi, and it appears to have been to record this gift that the inscription was engraved.

The inscription on the Heft Kaneh is in the same character, and refers to the same parties.

The alphabet in which these inscriptions are written is very similar to that of the Gupta inscriptions, on the Allahabad Lath; if anything, more resembling the ancient Lath character; we could not therefore have much difficulty in fixing as their approximating date, the fifth century after Christ, and I do not think there can be much difficulty in identifying the Yajna Verma of the inscription, with the Yajna Sri of the Andhra dynasty of the Puranas, and who it is now generally allowed ascended the throne of Magadha, about the year 408 of our era.

The invocation to Devi and the language of the inscriptions is decidedly much more Brahmanical than Buddhist, and as they do not refer to the caves, we are left in uncertainty as to whether the Vermas really excavated them, and to what religion they were dedicated. It is difficult, however, to believe that any work of the Brahmans could be left without any indication of their polytheism, and the simplicity of the caves is a strong evidence in favour of their Buddhistical origin; and as there appears nothing to make us believe that the inscription is necessarily integral, but may have been added afterwards, it affords, I fear, no sufficient data for coming to any satisfactory conclusion regarding the monument in question.

A little further on is another group, the Karna Chapura, and the Lomas rishi caves. They appear to be adorned with some rude sculpture of a Brahmanical tendency. But none of the inscriptions on them that have been deciphered throw any light on their date, further than that they appear to be more modern than the two last referred to. But the drawings I have seen of their sculpture are much too imperfect and rude, to enable me to judge of their age by comparing them with the temples I have visited.

The next series in antiquity, and one of the most interesting in India, though one of the least known, are the caves of Khandagiri, situated about twenty miles from Cuttack, and five from Bobaneswar. There are here two small but picturesque and well-wooded hills of a coarse-grained sandstone, very rare in that neighbourhood, which seem from a very early period to have been a spot held particularly sacred by the Buddhists; and though no caves exist here that can vie in size or magnificence with those of Western India, there are a greater number of authentically ancient caves here, than in any other series, and the details of their architecture are of a higher class than any other I am acquainted with.

These caves were first described by Stirling, in his valuable Memoir on Cuttack, in the sixteenth volume of the Asiatic Researches, and drawings of some of them were published by Lieut. Kittoe, in the sixth and seventh volumes of the Journal of the Asiatic Society; they still however require and deserve a much more careful examination than either of those gentlemen have been able to bestow on them, though the task is by no means an easy one, for they are still inhabited by Fakeers and Byragis of various classes, who, to increase their accommodation, have built up mud walls between the pillars of the verandahs, rendering the interior extremely dark, while the accumulated smoke of a thousand years' cooking has blackened the whole so as to increase the gloom, and has also encrusted over the sculpture in such a manner as to render its details almost invisible.

There is also considerable difficulty in gaining admission to the inhabited caves, and I found it impossible to effect an entrance into the finest of the whole series, which by the way does not seem to have been discovered by either of the gentlemen above-mentioned, and which I stumbled on by chance while wandering about without any guide. It is now inhabited by the chief of the Fakeers, whom I saw preparing to cook his dinner, and who was extremely insolent when I attempted to parley with him on the subject, so that I was obliged to content myself with an imperfect survey from above.

The caves on the Udyagiri (hill of the rising sun) are entirely Buddhist, and of a very early and pure type; those on the other hill, the Khandagiri, are much later, and principally Jaina.

The earliest of the whole series is the so-called Hathi Gumpha, or elephant cave. It is a large natural cavern, the only one in those hills, and very slightly, if at all improved by art, and consequently was probably the earliest chosen as a residence by some Bauddha ascetic; and it is not improbable that it is to the sanctity acquired by some early saint, who took up his abode in it, that we owe the subsequent excavations in the hill. It is on the face of the rock above this cave that there exists the long inscription in the Lath character, which first attracted the attention of Mr. Stirling and his enthusiastic companion Major Mackenzie, and which Mr. Prinsep subsequently deciphered, (as far as its imperfect state would allow,) and published in the sixth volume of his Journal. Unfortunately, the inscription contains no name that has been identified in any of the lists, and as there is no date, we are left entirely to the character of the letters, and its internal evidence, for an approximative era in which it could have been written.

There does not appear much reason to doubt the correctness of the etymological grounds on which Mr. Prinsep assumed the date to be somewhat subsequent to the Asoka inscriptions in the same neighbourhood. At least, I do not know of one reason that can be urged for assigning it a higher antiquity. But as it would take up too much space here to enter into all the arguments that might be urged on this head, I shall content myself with stating, that I think the balance o evidence inclines to a date about two hundred years before Christ, and that cannot be very far from the truth.

The other caves on this hill have all inscriptions in the Lath character, and therefore may all be safely assigned to a date anterior to the Christian era, and probably between that and the date above given. The only apparent exception is that on the Ganes Gumpha, which is in the Kutila character of the tenth century of our era; but the cave in which it is engraved is so entirely of the same character as the rest, both in architecture and sculpture, that it cannot be assigned to a different era, and the inscription must be considered as marking its conversion to the Brahmanical faith. All the larger ones consist of a pillared verandah, of from six to ten feet in width, the length varying with the number of cells which open into it from behind, these being generally about six feet wide. In the Thakoor cave, (the large one above alluded to, to which I could not obtain admittance,) the colonnade is the longest here, being fifty-five feet in length, with wings extending at right angles to it in front.

In the Ganes Gumpha, which is perhaps the most beautiful of the series, the verandah is thirty feet long by six feet wide, and seven in height; there are four doors which open from it into the inner excavation, which is seven feet six inches deep, and of the same length as the verandah. In this instance it is not divided into separate cells[1].

The sculpture on this cave is superior to anything I have seen in India, and I wish much it could be cleaned and casts taken of it. It consists of a frieze at the back of the verandah, broken into two compartments by the heads of the doors. A representation of it is published in the seventh volume of the Journal of the Asiatic Society, p. 683, but Mr. Kittoe's sketch was a very hurried one, and the lithography is not the most perfect, so that it does not do the subject justice.

The only sculpture I am aware of that resembles it in India, is that of the Sanchi Tope, near Bhilsa, and it resembles European art more than any other. There are no gods, no figures of different sizes, nor any extravagance; everything is in keeping and in good taste.

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[1] Plate No. 1.

Some have only two intercolumniations in front, and by far the greater number only one, or to speak more correctly, consist of an outer cave communicating with the inner by a small door, and in one instance, the rock containing a small cave has been sculptured into the form of a tiger's head, whose gaping mouth forms the vestibule to the cell; I do not know of any other instance of a similar vagary.

On the Khandagiri the caves are much less interesting, being all of an evidently later date. One called Lelat Indra Kesari ka Noor, probably was excavated by that prince, and its date therefore will be the beginning of the seventh century; it is an excavation of no great extent, and it is not easy to make out from the very unfinished state in which it has been left, for what purpose it was designed, being extremely unlike all the others of the series.

As Lelat Indra, however, was a devout worshipper of Siva, and built, or at least finished the great temple at Bobaneswar, it was probably intended to be a Brahmanical cave, like those at Ellora or Elephanta; his Rani, however, was a follower of Buddha, and this may have been her work.

Close to it is the largest cave on this hill; like most others, it consists of a verandah with pillars and a long apartment parallel to it, to which has recently been added an outer verandah of masonry plastered and painted. In this cave are sculptured the images of the twenty-four Thirthankars, and their female energies, which are probably coeval with its excavation, and at one end an image of the monkey-god Hanuman, though he probably is of a later date; he was however too well covered with red paint for me to make out from the style of sculpture to what age he belonged.

None of the other caves on this hill are particularly deserving of notice. On the top of it stands a small Jain temple erected during the the supremacy of the Maharatta; a neat building, but, as might be expected from the character of its founders, of no great pretensions.

One of the most singular features in all the Buddhist caves here, is the total absence of all images of Buddha, and indeed of any apparent object of worship; a circumstance which alone would, I conceive, be sufficient to place them in a higher antiquity than any series in Western India; for it is tolerably certain that the adoration of images, and particularly of that of the founder of the religion, was the introduction of a later and more corrupt era, and unknown to the immediate followers of the deified.

Whatever sculpture is used in these caves, and they contain some of a very high class, is purely ornamental, and has no reference either to the worship of Buddha, or to the purposes for which these caves were excavated[1].

Another singularity is the absence of a Chaitya cave, though it is mentioned in the inscription on the Hathi Gumpha, "the King Aira (?) caused to be constructed subterranean chambers, caves containing a Chaitya temple and pillars." In this instance, however, the cave, if one ever existed, may have been destroyed by those who have quarried stone here for the building of the Bobaneswar and other temples in the neighbourhood. But I am more inclined to think that the Chaitya here was a structural building, probably standing on the summit of Khandagiri hill, and that it has consequently been destroyed, like most of its congeners in India, in the struggles between the Buddhists and Brahmans, its materials removed, and probably a portion of them employed in constructing the present fane.

It is more than probable that it was in the Daghopa attached to these caves, that the famous tooth relic was preserved; which, during the troubles consequent on the invasion of the Yavanas, was removed for safety to Ceylon in the beginning of the fourth century, where it, or its representative, still exists.

I may also remark, that though all the roofs of the caves are flat, and flat architraves run in every instance from one pillar to another in the verandahs, still the early Buddhists could not get over their singular predilection for the arch, and have employed it as an ornament whenever it could be introduced; and thus, though all the doors are square-headed, scarcely any exist that have not a semicircular or rather horseshoe ornament above, placed in the manner of a discharging arch in common masonry. I call this singular, for though the form of the arch is almost universal in all Buddhist caves, it does not, that I am aware of, exist in any Brahmanical one, nor in any structural building in Hindustan prior to the Mahomedan invasion, nor then in almost any Hindu building down to the present time, with the exception of some temples built during the reign of Akbar the Great.

There are not, as far as I am aware of, any other caves on the eastern side of India, certainly none of any importance, except those at Mahavellipore, which being the most modern in India, I will describe last, having previously made the circuit of the peninsula; and we must therefore step at once to the western side, where they exist of a size and magnificence totally unknown on the eastern side. I have not been able to visit all the caves myself, but I have examined those of Ajunta, Karli, Salsette, Doomnar, Ellora, Elephanta, and Mahavellipore. The caves of Nasik, Junir, and Baug, I have not been able to visit, but from all I could learn on the spot, the two first mentioned series contain no type not seen at Karli, Ellora, or Salsette; while the latter are so similar to those at Ajunta, that though extremely numerous, and no doubt interesting, I am not aware of their offering any thing of a new or distinctive character.

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[1] In one cave, the Jodey Gumpha, some figures seem to be worshipping the Bo Tree; see Kittoe's plate above referred to.

In attempting to describe so many caves, it would be desirable, if possible, to adopt some mode of classification by which to connect so many dissimilar objects. The most desirable would certainly be a chronological one, describing each cave according to its date; but their ages are so imperfectly ascertained, that this would at present, I fear, only lead to confusion; and as each series extends through several hundred years, some nearly a thousand, and consequently, they were contemporary one with another, no succession can be made out between the different series. I shall therefore describe those I have visited in the order in which I have named them above, placing Ajunta first, because it is the most perfect and complete series of Buddhist caves in India, without any admixture of Brahmanism, and contains types of all the rest; next Karli, which, though by no means so extensive as the first, is still purely Buddhistical, and contains the finest Chaitya cave in India. The Salsette or Kannari caves are also purely Bauddha, but very inferior in every respect to the two former. Those of Doomnar and Ellora contain a strong admixture of Brahmanism, and those of Elephanta are entirely Brahmanical, though perhaps not later than some of those at Ellora.

And lastly, I will revert to those at Mahavellipore, which are entirely Brahmanical, and excavated after all the other series were finished.

After crossing the valley of the Taptee from the north, you approach a ghát of some five or six hundred feet in height, supporting the table-land of the Dekkan. The upper line of the ghát is flat and regular and the wall, if I may use the expression, tolerably even except in some places where it is broken by ravines, which extend for a considerable way into the table-land above. It is in one of these ravines that the caves of Ajunta are situated. The entrance to the ravine is nearly half a mile in width, but is gradually narrower as you wind up it, till it terminates in a cascade of seven falls, called the sat koond; the

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[1] See Transactions of Bombay Literary Society, vol. ii., p. 194.

lowest fall may be one hundred feet high, the others together one hundred more.

Immediately below the fall the ravine makes a sudden turn to the right, and it is in the perpendicular cliff forming the outer side of the bend, and facing the koond, that the caves are situated; the whole series extending, as nearly as I can guess, about five hundred yards from north to south-east.

The most ancient are situated about one-third of this distance, or about one hundred and fifty yards from the most northern end, and are the lowest down in the rock, not being above thirty or forty feet above the bed of the torrent, while to the north they rise to about eighty feet, and at the southern extremity they rise to about one hundred or one hundred and fifty feet; the extreme excavations however are at this end unapproachable, in consequence of the ledge of the stratum, which formed the terrace of communication along the whole series, having fallen away, and left the face of the cliff perpendicular for its whole height, which is as nearly as I could estimate about three hundred feet.

Names have been given to some of the caves, but these are neither very appropriate nor well understood, and as the local cicerone who accompanied me the first day gave the same name to different caves at different times, and, I believe, invented others when his memory failed him, I adopted the surer plan of using numbers; and, beginning at the northern end, or that lowest down the stream, called the first cave number one, and so on to twenty-seven, which is the last accessible cave at the south-eastern extremity; and as this plan can lead to no confusion, I shall now follow it.

According to this arrangement, the ninth, tenth, nineteenth, and twenty-sixth, from the north end, are Chaitya or Daghopa vaulted caves, without cells; the rest are all Viharas, or Monasteries, with cells and flat roofs.

The lowest down and the most ancient, are the twelfth and eleventh; the first-named is the plainest cave of the series, being entirely without pillars, and there is no sanctuary or image, nor, apparently, any visible object of worship; indeed, its only ornament consists of seven horseshoe canopies on each side, four of which are over the doors of the cells, the other three merely ornamental; they are very similar to those at Cuttack, and under them is a reeded string course, similar to that used in those caves, and which I have not observed any where else except there and at the great Karli cave; indeed, it resembles the caves in the Udyagiri in almost every respect, except it being square, thirty-six feet seven inches each way, while those at Cuttack are all longer than their depth. The front would have afforded the best means of identification, but unfortunately it is entirely removed by the rock above giving way; I searched earnestly for inscriptions, but could only find one on the inner wall, in a character slightly modified from that on the laths, and, therefore, probably written early in the Christian era; but it does not, from its position, seem to be at all integral, or to form a part of the original design, and therefore would not fix the date even if deciphered.

The next cave to the north, number eleven, is not quite so large, being only thirty-seven feet ten inches, by twenty-eight feet six inches; it is very similar in some respects to the last, but has four pillars in the centre supporting the roof[1].

This is, probably, one of the earliest instances of the introduction of pillars for such a purpose, and though they are clumsily used here, the example is interesting, as it was to the extended use of them, that we owe all the magnificence of the modern Vihara; the window on each side of the door is divided into three lights, by two pillars standing on each cill[2]. The sanctuary is not finished, and, indeed, seems to have been an afterthought; but there are antelopes, lions, and a boy in an attitude of prayer, sculptured on the wall in the very best style of art, and evidently coeval with those of the Ganesa Gumpha at Cuttack; the walls have been stuccoed and painted, but the paintings are so much destroyed as to be scarcely distinguishable; I could discover no inscription on any part of it.

The next two caves to these on the north side, numbers ten and nine, are two Daghopa caves, almost counterparts of one another, except that the first is very much the largest, being ninety-four feet six inches in depth, and forty-one feet three inches wide, while the other measures only forty-five feet by twenty-three feet.

The largest one has, or rather had, twenty-nine pillars surrounding the nave; they are plain octagons, without capital or base, and have been covered with stucco and painted; thirteen of them are fallen, leaving large gaps in some places, and the outer screen is entirely gone. Like all Daghopa caves, it has a ribbed roof. In some caves, the ribbing is in stone, in others, as at Karli, it is in wood. This cave combines both methods, the aisles being of stone, while the nave has been ornamented with wood, which has entirely disappeared, except some of the battens and pins that fastened it to the rock, and the footings for the ribs, which are sunk to some depth in the rock.

The Daghopa is plain and solid, without any ornament, except the square capital or tee on the top, but there can be no doubt that it was

[1] Plate No. 5, fig. 1.

[2] Fig. 2.

once richly ornamented, probably in wood, for which some mortices remain; and that it was crowned, as at Karli, by three umbrellas.

The whole of this cave has been covered with stucco and painted, and many of the smaller paintings on the pillars, and in the panels of the roof of the aisles, remain, consisting of figures of Buddha and his disciples in various attitudes, rosettes and other ornaments; but owing to the ruined state of the front, the rain apparently has beat in, and destroyed the larger subjects. There are several inscriptions painted on the plaster, and though none remain sufficiently entire to be transcribed, yet sufficient remains to show, that the characters are those that were used subsequent to the Christian era.

On the exterior face, however, of the cave, but very high up, is an inscription of some length in the pure Lath character, which would at once give an antiquity to the excavation of about 100 or 200 B. C., as far as such evidence can be relied on.

The smaller cave had only twenty pillars surrounding the nave, similar to those in the other; eight of them are broken, but at the entrance there are four pillars of a different form and richer detail. Of its paintings but little remains, except in the inner wall, where they are still tolerably entire. In this circle I found two inscriptions painted on the stucco on the walls; the first under a figure seated on a chair, with the fore finger of the left hand touching that of his right, the second under a Daghopa, painted also on the wall. And on the south side of the cave, opposite the first, there was a third inscribed in a panel under another figure, seated in a chair, but so defaced, that I could only see that it was in the same character as the other two; its existence, however, appeared to me very valuable, from its position as an integral portion of the design which it forms a part of, and if its age can be determined, it will show the period at which the paintings were executed. I have not myself much difficulty in assigning it, on the faith of Mr. Prinsep's alphabets, to the second or third century of our era.

The eighth cave from the end is merely a natural cavern, without any inscription or object of interest; and the seven that precede it, are so modern, that I would prefer going back to number thirteen, and continue to describe them as they occur from this point towards the southern extremity, as I shall thus preserve something like the succession of dates in which they were excavated, without the confusion that would arise from selecting here and there.

Thirteen is only a small cave with two cells, and has nothing remarkable about it.

Fourteen is a large unfinished cave under thirteen, and apparently meant as an under story to it; only the first line of the pillars in the interior is hewn out, and left in a rough state. The verandah pillars, however, are finished, and are of an unusual form, from being merely square piers with plain bands.

Fifteen is a plain square cave, but filled up with mud and debris nearly to the roof, so that there is considerable difficulty in effecting an entrance, and only its general plan can be made out.

Numbers sixteen and seventeen are the two finest Viharas of the series, and apparently belong to, and were excavated at the same time, with nineteen, which is the best finished Chaitya cave of the series; to these may be added the one beyond number twenty, as they all seem of the same age, and the four together form the most interesting group of the Ajunta caves. There are two long inscriptions on the external faces of sixteen and seventeen, which probably contain something of their dates and history[1]; I did not, however, attempt to copy either, and my opinion of their age, therefore, rests entirely on their architectural details and their position in the series; I believe them to have been excavated between the fourth and sixth century after Christ, but more probably about the latter date.

Sixteen is a square cave, sixty-seven feet six inches wide, and sixty-five feet two inches deep, exclusive of the sanctuary; the centre hall is surrounded by twenty pillars, generally of an octagon form, the sides of which are adorned in painting with something like a Roman scroll, alternating with wreaths of flowers[2].

All the details of its architecture are particularly good and elegant, more so than any other cave in this series; there are no side chapels, but eighteen cells surrounding the great hall. The figure in the sanctuary is seated with his feet down; some of the paintings are tolerably entire and extremely interesting, though not so much so as those in the next cave; the swords in the soldiers' hands are shaped something like the Nepalese Kookry, and the shields are of an oblong form.

Seventeen, generally called the Zodiac cave, very much resembles the last described in almost every respect. Its dimensions are sixty-four feet by sixty-three feet, and it has twenty pillars disposed as in the other; it is not, however, so lofty, and the details of the pillars are by no means so graceful or elegant as in number sixteen. The paintings, however, are much more entire, and though the colours in some places are a good deal faded, the subjects can generally be made out.

On the right hand wall, as you enter, a procession is painted.

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[1] Journal of the Asiatic Society of Bengal, Vol. v. Plate 29.

[2] Plate No. 6.

Three elephants issuing from a portal, one black, one red or rather brown, and the third a white one, which seems the principal one of the group; showing how early arose the predilection for these animals, which still exists among the Burmese and Siamese of the present day. Chattahs and flags are borne before them, and men with spears, swords, and shields make up their retinue.

On the back wall is a hunting scene, in which a maned lion, powerfully and well-drawn, forms the principal object of attraction; there are also deer and dogs, and men on horseback and on foot without number.

In the verandah to this cave are some singularly interesting paintings; at one end a circular one, which I at first took for a zodiac, though, on further examination, I gave up the idea; its centre is divided in eight compartments, and the outer circle into sixteen or seventeen. Each of these compartments are crowded with small figures, but what the subject is I could not make out.

Over the door are eight figures sitting cross-legged; the first four are black, the fifth fairer, the next still more so, the last fair and wearing a crown. It may be remarked, that there are more black people painted in this cave than in any of the others: the women, however, are generally fair, and the men all shades, from black to a European complexion. The roof is painted in various patterns, not at all unlike those still existing in the baths of Titus, though in an inferior style of art. I had not time, even if I had had the ability, to copy these interesting paintings, and I fear any one who now visits them will find that much that I saw has since disappeared.

The style of these paintings cannot of course bear comparison with European painting of the present day; but they are certainly superior to the style of Europe during the age in which they were executed: the perspective, grouping, and details are better, and the story better told than in any paintings I know of, anterior to Orgagna and Fiesole. The style, however, is not European, but more resembles Chinese art, particularly in the flatness and want of shadow; I never, however, even in China, saw anything approaching its perfection.

I looked very attentively at these paintings, to try and discover if they were fresco paintings, or merely water colours laid on a dry surface; but was unable to decide the point: the colour certainly is in some cases absorbed into the plaster, and I am inclined to think they may have been painted when it was first laid on, and consequently moist; but I do not think it could have been done on the modern plan of painting each day all the plaster laid on that day.

Eighteenth Merely a porch of two pillars, apparently the commencement of an excavation, or of a passage or entrance to

The Chaitya cave, number nineteen[1], which is more remarkable for the beauty and completeness of its details than for its size, being only forty-six feet four inches, by twenty-three feet seven inches in width. Seventeen pillars surround the nave, all of which are very richly ornamented, and above them is a band occupying exactly the same position as a triforium would in a Christian church, and occupied here with niches containing alternately figures of Buddha sitting cross-legged, and standing. The roof is ribbed in stone, but the most interesting feature is the Daghopa, which has here the three umbrellas in stone rising till they touch the roof; in front of the Daghopa is a figure of Buddha, standing. The exterior of this cave is as rich as the interior, and though damaged in some parts, by the rocks falling from above, the injury is less than in most others, and very little labour would free the lower part from the accumulated materials, and display entire one of the most perfect specimens of Buddhist art in India; but one that I must not dwell on longer, as I feel that, without drawings, I should be unable to convey to others any correct impression of its beauties or details.

Twenty. The last of this group is a small Vihara of singular plan, twenty-eight feet two inches wide, by twenty-five feet six inches deep, with two cells on each side. There is no internal colonnade, but the roof is supported by advancing the sanctuary about seven feet into the hall, and making its front consist of two columns in antis. There is also a verandah in front, with an apartment at each end. Its paintings are almost entirely obliterated, except those on the roof, and these consist of frets and flowers, not otherwise interesting than merely as showing its connexion with the Viharas sixteen and seventeen. There is an inscription on one of the pillars of the verandah, but very much obliterated, and apparently not integral.

Before proceeding further in this direction we must return back to the seventh and sixth from the north, and which, though scarcely coeval with the last group described, are certainly later than those first mentioned, and as certainly earlier than the group which succeeds, and which closes our list; but whether they are antecedent to numbers sixteen and twenty, or slightly posterior to them, I am unable to decide.

Number seven is merely a large verandah, sixty-three feet four inches in length, by thirteen feet seven inches in breadth, with the cells opening at the back of it, something in the manner of the Cuttack caves; the front line of the verandah is broken by the projection of two porches of two pillars each, which are here particularly interesting, as they are extremely similar to the pillars at Elephanta, and those in the Doomar Lena at Ellora, and therefore probably not far distant in date. There is also a chapel with two pillars at each end.

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[1] Plate No. 3.

To the left of the sanctuary are five crosslegged figures, each seated on a lotus, and a lotus between each; on the right, two cross-legged and seven standing figures, the centre lotus of each series supported by figures with snake canopies. Within the sanctuary, on each side, are two large and one smaller figures, and two men sitting cross-legged, and having chowries in their hands. On the step are sixteen figures of disciples seated cross-legged.

Number six is the only two-storied cave at Ajunta. The upper story has twelve pillars, octagons changing into plain squares at top and bottom, and with bold bracket capitals, not painted but sculptured with figures of Buddha. At first I thought this a Jaina cave, and tried to find the twenty-four thirthankars in some place, but was unsuccessful; the series consist of sixteen, eight, four, and are apparently of disciples, as none had the emblems by which the thirthankars are usually recognised.

The cave is fifty-three feet square, the aisles nine feet wide. The lower story is of the same dimensions as the upper, and of the same plan, except that four additional pillars have been introduced in the centre; they are all plain octagons, changing to sixteen sides, with pilasters to each row. Seven of these only are standing, nine having fallen down, owing to the inferiority of the rock in which they are cut, and also to water entering from above, and rotting the stone; the whole cave has a dismal and ruinous look not common here; and it is also without sculpture, having apparently depended entirely on painting for its decoration. The pillars in front of the sanctuary are of the same Elephanta character as those of the last-mentioned cave.

There now only remains to be described the last group of these caves, consisting of the first five from the north, and the last seven at the other extremity; they are all so nearly of the same age, that I am quite unable to discriminate between them, and all evidently the last excavated here. They are singularly unlike any other caves or structural buildings I am acquainted with, and I had consequently less means here than with the others of coming to a satisfactory conclusion regarding their dates; if, however, we assume the last group to have extended to the sixth or seventh century of our era, these must range between that period and the tenth, after which time I conceive no Buddhist caves were excavated in India, and we cannot therefore be far wrong in placing them in the eighth and ninth centuries.

As I cannot fix their succession, I may as well begin with number one, and passing over those already described, proceed to twenty-seven, the last visited.

The first that commences, or rather ends, the series on the north, is a very handsome vihara cave, with a fine verandah ninety-eight feet in length, and a chapel at each end, the hall is sixty-four feet square, adorned with twenty pillars three feet in diameter, richly carved, and with bracket capitals. The cave is a good deal filled up with mud, but, notwithstanding, the paintings are tolerably entire, and some of them very interesting; though both they and the details of the architecture are small and frittered away, when compared with the two first-described groups.

The second is a twelve-pillared cave of which I have given a plan[1]; it is in very good preservation, and the paintings, particularly on the pillars, are tolerably perfect. In the sanctuary there is a statue, of course of Buddha, and a chapel on each side of it, at the end of the aisles. In the one on the north are two most portly, fat figures, a male and female: in the south one, two male figures, occupying a like position. Who they were meant to represent I could not make out, for they were quite strangers to me.

The third is a very fine bold cave, and one of the largest viharas of the series, but does not appear to have been quite finished; the colonnade in the centre consists of twenty-eight pillars, (the only instance I know of such magnificence,) disposed in four ranges of eight pillars each, counting the angular ones in each line; the pillars, generally bold octagons eleven feet in circumference; the whole hall is ninety-one feet square; the aisles twelve feet two inches wide, which is also the width of the verandah. This cave never having been finished does not appear ever to have been painted. It is now so dreadfully infested with bats that it is almost impossible to stay in it any length of time, and I had not the courage to explore its cells; as, however, I found nothing of interest in any of the others, I do not suppose there was much to regret here.

The fourth cave is situated higher up in the face of the rock, and as there is no path to it, I did not discover its existence till the day I was leaving the place, when I saw it from the opposite side of the ravine which I had scrambled up to in a wild-goose chase, to look for the city of Lenapore, having been delighted with its name, and convinced, in spite of the assurance of my guides, that it must contain something of interest; it was, however, "vox et præterea nihil."

The fifth was so choked up with mud, that it was almost impossible to see what it was, further than that it had been a square cave of no great dimensions.

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[1] Plates No. 2 and 7.

We must now return to cave number twenty, the last described towards the south.

Leaving it you proceed for some distance along the ledge, which, owing to a torrent coming over here during the rains, is more than usually ruined, and the path in some places very narrow and dangerous; and as I had to traverse this several times in the middle of the day at the end of March. I suffered extremely, not only from the heat of the sun, but from the reflection from the rocks, which were heated like an oven.

Having passed this, however, you arrive at the twenty-first cave from the north end, a large vihara, fifty-two feet six inches deep, by fifty-one feet six inches in width. It is similar in almost every respect of plan, style, and execution, to the cave above described as number two. It is, not, however, quite finished, as the pillars of the sanctuary are only hewn rough out of the rock, and many of the details are left incomplete. Its paintings are now nearly obliterated, except on the wall on your left hand as you enter, where there still exists a large figure of Buddha, of a black complexion, or at least very dark, and with red hair, and attended by black slaves. There are several ladies introduced into the composition, but notwithstanding the blackness of their companions, they are here, as in most other caves, represented with complexions almost as fair as Europeans. There is a small chapel with two pillars in antis, on each side, as well as at each end of the lateral aisles. The verandah has fallen down, but the chapels at each end remain, with the pilaster which terminated the colonnade at each end, showing its dimensions and depth.

As I before remarked, the execution of this cave, as well as of number two, is decidedly inferior to that of the intermediate ones; not indeed in richness and quantity of ornament, but in style. There is a weakness in the drawing of the details, and the ornaments are crowded and cut up in a manner that gives a tawdry and unsatisfactory appearance to the whole; very unlike the bold magnificence of those of an earlier age. To use a comparison drawn from the architecture of our own country, they bear the same relation to numbers sixteen, seventeen, and twenty, as the Tudor architecture does to the pure Gothic of the Third Edward.[1]

The twenty-second is a small cave only seventeen feet square, without pillars, excepting two rough-hewn ones in front of the sanctuary, in which is a figure of Buddha seated, with his legs down.

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[1] Compare Plates No. 6 and 7.

The twenty-third is another vihara of twelve pillars, very similar in all respects to numbers two and twenty-one; it has, however, been left in a very unfinished state, without even an image in the sanctuary, or indeed anywhere else, and there exists no trace of painting that I could detect in any part. Its dimensions are fifty-one feet by fifty-one feet eight inches.

Number twenty-four is the pendant in the series to number three, and would have been one of the finest had it been finished; but merely its general form and dimensions have been made out. Only one pillar has been completely sculptured, and one side of the colonnade exists as a wall with slits in it. It was intended to have been a twenty-pillar cave; the centre hall would have been about forty-three feet square, and the whole about seventy-four feet each way. The details of sculpture and style are of the same class as two, three, and twenty-one, but much more pains appears to have been taken with their execution, and on the whole they are richer than those above alluded to, if it is fair to judge by what is visible; for besides that so little has been executed, the cave is now half filled with mud. The verandah has been completed, but three out of its six columns are broken, and the others much injured.

This cave is particularly interesting as showing the whole process of excavation, from its commencement to the finishing of the details, some parts having been left in every stage of advancement. The rock (amygdaloidal trap) in which they are cut is of a soft, coarse texture, so that the labour of excavation could not have been so great as is generally supposed; indeed, I am very much inclined to believe that this mode of excavating was the cheapest and least laborious by which buildings of this class could be erected. If the stones were quarried so as to be of use for building purposes at the same time, it certainly would be so; but that does not seem to have been the case here, as all the rough work appears to have been done with the pick-axe.

Twenty-five. A small rude vihara cave, with a verandah of ten pillars.

Twenty-six is the fourth vaulted or chaitya cave of this series, and decidedly the most modern. In general plan it is very similar to number nineteen, but its dimensions exceed the former very considerably, the whole width being thirty-six feet three inches, that of the nave seventeen feet seven inches, and the total length sixty-six feet one inch. Its sculptures, too, are far more numerous and more elaborate, indeed, more so than in any other cave of the series; but they are very inferior both in design and in execution, so much so that if other proof were wanting this alone would be sufficient to stamp this at once as one of the latest, if not the last executed cave of Ajunta.

The Buddha on the front of the Daghopa is seated with his feet down.

The walls of the aisles are entirely covered with sculpture, principally figures of Buddhas or disciples, of all sizes, and in every Buddhist position. Among others in the south aisle is one twenty-three feet long, reclining at all his length, being the attitude in which they prepare to receive nirvana (beatitude); above him are an immense host of angels, awaiting apparently his arrival in heaven, and one beating most vigorously a big drum.

The fat figures with judges' wigs, who do duty as brackets, have here four arms, which is the only instance I am aware of in these or any other Buddhist caves, of such a piece of Hinduism.

The details of the pillars, particularly those of the verandahs, are of precisely the same character as all those of this group, but their details are worse executed here, than in any of the others.

There are two inscriptions on the outside of the cave apparently integral, one under a figure of Buddha on your left as you enter, the other is much broken but more distinct, upon your right. The character used in them belongs to the ninth or tenth century of the Christian era.

The twenty-seventh cave is a small square vihara without pillars, and the sanctuary only commenced, and the whole left in a very unfinished state; the front has entirely crumbled away, so that its dimensions can scarcely be ascertained; it was, however, about forty feet in width.

There are one or two caves beyond this, but the ledge having fallen away, they are quite inaccessible. From the ruined state of their fronts, and the debris that has accumulated before them, I was unable to guess either at their size or state of progress; judging, however, from the last caves visited, there cannot be much worth seeing in them, and indeed, I am not quite sure that what I took for caves were not holes, or shadows thrown by masses of rock.

I have been more particular in describing this series than any other, partly because I am not aware that any detailed account of them has been given to the public to which I could refer, and partly because they are in some respects the most interesting series of Buddhist caves in India. They cannot, indeed, boast of a chaitya cave like Karli, but the viharas here are more splendid than anywhere else; they are more entire, and are the only caves that retain much of their original painting and decoration. They also are purely a Buddhist series, and almost every change in cave architecture can be traced in them during a period of about one thousand or twelve hundred years, which is nearly the term during which that religion flourished in its native land; and they thus form a sort of chronometric scale, which I found extremely useful in my attempts to ascertain the ages and dates of caves in other series, none of which are so complete as this one.

The others having all been described before, I shall merely notice such peculiarities as bear specially upon my subject, and refer to printed descriptions for details.

BAUG.

In a small valley or ravine penetrating, like that at Ajunta, into a table-land resting on the ghât on the north side of the valley of the Taptee, and about three miles from the small town of Baug, are situated four caves, which have been described by Lieutenant Dangerfield in the second volume of the Transactions of the Literary Society of Bombay. His description is remarkably clear, and with the drawings that accompany it, enable one to determine at once what they are, and almost the age at which they were excavated.

The largest vihara would at Ajunta be a "twenty-pillar" cave, but owing to the badness of the rock in which it is excavated, the architect left four additional columns in the centre of the hall. In the sanctuary there is a daghopa, an arrangement I do not know of elsewhere, and can only account for here, by supposing that this symbol was necessary for Buddhist worship, and there being no chaitya cave in the series it was necessary to introduce it here; in that case, however, it is strange that they omitted the figure of Buddha in front, which seems to have been the case.

The second cave is an unfinished one, but the third, at some distance from the two first, is a vihara eighty feet by sixty, and though much ruined retains a good deal of its original paintings; judging from them, the only detail given, they appear to be of about the same age as the second group at Ajunta, whilst the large cave belongs to the last of that series, or may be intermediate between the two.

There are two other caves at Baug, but one entirely ruined, the other only commenced.

KARLI.

About half way between Poona and Bombay on the right hand side of the valley as you proceed towards the sea, is situated the great cave of Karli, without exception the largest and finest Chaitya cave in India, and fortunately also the best preserved.

Its interior dimensions are one hundred and two feet three inches for total length, eighty-one feet three inches for length of nave. Its breadth from wall to wall is forty-five feet seven inches, while the width of the nave is twenty-five feet seven inches[1]. The nave is separated from the side aisles by fifteen columns on each side, of good design and workmanship; on the abacus which crowns the capital of each of these are two kneeling elephants, and on each elephant are two seated figures, generally a male and female, with their arms over each other's shoulders; but sometimes two female figures in the same attitude. The sculpture of these is very good, and the effect particularly rich and pleasing. Behind the Chaitya are seven plain octagonal piers without sculpture, making thus thirty-seven pillars altogether; the Chaitya is plain, and very similar to that in the large cave at Ajunta, but here, fortunately, a part of the wooden umbrella which surmounted it remains. The wooden ribs of the roof, too, remain nearly entire; and the framed screen, filling up a portion of the great arch in front, like the centering of the arch of a bridge, (which

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[1] In the Atlas to Lord Valentia's Travels, a detailed plan of this cave is given, on which the dimensions taken by the scale are forty-six feet wide by one hundred and twenty-six feet long; and as the plan appears to have been drawn with considerable care, (by Mr. Salt, I believe,) and these figures are repeated in the text, I was a good deal staggered by finding so great a discrepancy, and inclined at first to give up my own as incorrect. I have however retained them, not only because they were taken with care, and I cannot see how so great an error could have crept into them; but also, because Lord Valentia's dimensions are quite at variance with those of all the Chaitya caves I am acquainted with, as the following table will show.

	Length.	Width.		
No. 10, at Ajunta, is	94·6	41·3	or as	1 to 2·285
Cave at Karli, is	102·3	45·7	,,	1 ,, 2·243
Kannari, is	88·6	39·10	,,	1 ,, 2·222
No. 19, Ajunta, is	46·4	23·7	,,	1 ,, 1·961
No. 9, Ajunta, is	45·	23·	,,	1 ,, 1·956
Viswakarma, is	83·1	43·	,,	1 ,, 1·939
No. 26, Ajunta, is	66·1	36·3	,,	1 ,, 1·826

While Lord Valentia's dimensions for the Karli cave would be as 1 to 2·739.

It is not however only to confirm my own measurements that I have quoted this table, but to show on how regular a system these caves were excavated, and also as confirming their relative ages, as arrived at in the text from other grounds; for it will be observed, that the oldest caves are longest in proportion to their breadth; and that the ratio diminishes as we descend in the series in an almost perfect progression, the only apparent exception being the Kannari cave; but if that is a copy of the Karli one, as I have stated in the text, this is accounted for. If I am mistaken in placing it as a copy in the ninth century, it must on many grounds take its place as it stands in this table.

Another apparent exception is the small cave, No. 9, Ajunta, which in the text I placed in the same age as the one next it, and I confess I am at present unable to offer any suggestion to account for the discrepancy.

by the way it much resembles,) still retains the place in which it was originally placed.

At some distance in advance of the arched front of this cave is placed a second screen, which exists only here and at the great cave at Salsette; though it might have existed, and I am inclined to believe did, in front of the oldest Chaitya caves, Nos. 9 and 10, at Ajunta; it consists of two plain octagonal columns, with pilasters; over these is a deep plain mass of wall, occupying the place of an entablature, and over this again an attic, if I may use the term, of four dwarf pillars; except the lower piers, the whole of this has been covered with wooden ornaments, and by a careful examination, and measurement of the various mortices and footings, it might still be possible to make out the greater part of the design; it appears, however, as far as I could discover, to have consisted of a broad balcony in front of the plain wall, supported by bold wooden brackets from the two piers, and either roofed, or having a second balcony above it; no part of the wood however exists now, either here, or at Salsette.

It is more than probable, however, that this was the music gallery, or Nagara khana, which we still find existing in front of almost all Jaina temples, down even to the present day; whether the space between this outer and the inner screen was roofed over or not, is extremely difficult to decide; from the mortices at Salsette, I should certainly say it was so; but here the evidence is by no means so distinct, though there is certainly nothing to contradict the supposition.

I could find no traces of painting in this cave, though the inner wall has been plastered and may have been painted; but the cave is inhabited, and the continued smoke of cooking fires have so blackened its walls, that it is impossible to decide the question now; strangely enough its inhabitants are now Sivites, and the cave is considered a temple dedicated to Siva, the Daghopa performing the part of a gigantic Lingam, which it must be confessed it resembles a good deal. While I was there, there was a fair going on, and a festival in honour of his Hindu godship. All the flat spots of the rock were occupied by tents, and the dokaans of the various dealers in sweetmeats and trinkets who frequent these places; and every corner was occupied by pilgrims or devotees of some sort or other, who, though they did not actually prevent my entering or sketching, were extremely clamorous for alms, and annoyed me a good deal by their curiosity and impertinence.

It would be of great importance if the age of this cave could be positively fixed; but though that cannot quite be done, I think it probable that its age is antecedent to the Christian era; and at the same time, it cannot possibly have been excavated more than two hundred years before that era.

On the Silasthamba (pillar) on the left of the entrance, Colonel Sykes copied an inscription, which Mr. Prinsep deciphered in the sixth volume of the Journal of the Asiatic Society; it merely says, "This lion pillar is the gift of Ajimitra Ukas, the son of Saha Ravisabhoti;" the character, Prinsep thinks, that of the first or second century B.C. From its position and import, the inscription appears to be integral, and the column is certainly a part of the original design. For myself, I confess, that if the Lath character was ever in use on this side of India, I do not think it could have undergone so great a change as these characters show in so short a time, and that we must come down, at least, to the Christian era for this inscription.

In a letter lately received from Dr. Bird, of Bombay, he says, "I may mention that the one at Carlee presents an inscription of the twentieth year of Dutthama Hara, otherwise called Duttagamini, king of Ceylon, B.C. 163." I did not see this inscription; I do not know, therefore, whether it is integral or not, nor in what character it is written, which is of importance; for unless other circumstances confirm the identity, I should be afraid of being deceived by the nominal similarity of a king at so great a distance. If, however, the inscription, which Dr. B. will no doubt publish, should confirm this, it will be one of the most interesting dates that these inscriptions have yet disclosed to us.

In disposition and size, and also in detail, as far as similarity can be traced between a cave entirely covered with stucco and painted, and one which either never had, or has lost both these ornaments, this cave is so similar to the two at Ajunta which I had before placed about this age, and on the front of it there is also the reeded ornament which is so common at Khandagiri, and only exists there and in the oldest caves at Ajunta, that from all these circumstances I am inclined to think the above date 163 B.C., as at least extremely probable, though by no means as a date to be implicitly relied upon.

It is to this cave, more especially, that the remark applies that I made, p. 35, that the Chaitya caves seem at once to have sprung to perfection; for whether we adopt the Mahawanso for our guide, or Asoka's inscriptions, it is evident, that this country, under the name of Maharatthan in the former, and Pitenika in the other, is one of the unconverted countries to which missionaries were sent in the tenth year of Asoka's reign; and if, therefore, we assume the above date to be at all near the truth, a century had scarcely elapsed between the conversion of the country and the execution of this splendid monument. There is nothing in the Viharas here or elsewhere which I have placed about the same date, that might not have been elaborated from a natural cavern in that period, but there is a complication of design in this that quite forbids the supposition; and it must either be brought down to a much more modern epoch, or it must be admitted to be a copy of a structural building; and even then but half the difficulty is got over. Was that structural building a temple of the Brahmans or Buddhists? was it designed or invented since the death of Sakya Sinha? or did it belong to a former religion? and lastly, if we are correct in supposing cave digging to have commenced only subsequent to Asoka's reign, why, while the Viharas were still so small, and so insignificant, was so great a work undertaken in the rock[1]?

It would be a subject of curious inquiry to know whether the wood-work now existing in this cave is that originally put up or not. Accustomed as I had long been to the rapid destruction of every thing wooden in that country, I was half inclined to be angry when the idea first suggested itself to me, but a calmer survey of the matter has convinced me that it is; certain it is, that it is the original design, for we find it repeated in stone in all the niches of the front, and there is no appearance of change or alteration in any part of the roof; every part of it is the same as is seen so often repeated in stone in other and more modern caves, and it must therefore have been put up by the Buddhists before they were expelled; and if we allow that it has existed eight hundred or one thousand years, which it certainly has, there is not much greater improbability in its having existed near two thousand years, as I believe to be the case. As far as I could

[1] In the Mahawanso, (page 12,) it is said that the first convocation was held "in a splendid hall built at the entrance of the Sattapani cave," which would seem to prove that the cave then existed. The Mahawanso, however, was compiled one thousand years after that event, and the cave which may have been a subsequent excavation designed to mark the place where the meeting was held; or at best, it is but a tradition that such was the case.

In like manner it is mentioned in the Chinese work quoted by Colonel Sykes, in his notes on the political state of ancient India, (vol. vi., p. 203, Journal R.A.S.,) that Ananda, "after the death of Buddha, collected five hundred pious men in the cavern of Pi pho lo, and, jointly with them, collected the vinayas." This is evidently the same tradition still further improved upon, and coming from an authority so distant in date and locality, is not entitled to much respect, unless indeed some cave could be discovered of that date; or some circumstantial evidence be adduced to corroborate a tradition which may easily have sprung up from the importance which caves had assumed, as a form of Buddhist architecture, at the time these works were written.

ascertain, the wood is teak. It must be recolleted, that though exposed to the atmosphere, it is protected from being wetted by the rain, it has no stress or strain upon it but from its own weight, as it does not support the roof, though it appears to do so; and the rock seems to have defied the industry of the white ants.

As this is decidedly the finest Chaitya cave in India, a few remarks on the architectural ordinance of these caves may not be misplaced.

However much they vary in size or in detail, their general arrangements, as I mentioned before, are the same in every part of India, and the mode of admitting light, which is always so important a piece of architectural effect, is in all precisely identical.

Bearing in mind that the disposition of parts is exactly the same as those of the choir of a Gothic round, or polygonal apse cathedral, the following description will be easily understood[1]. Across the front there is always a screen with a gallery over it, occupying the place of the rood-loft, on which we now place our organs: in this there are three doors; one, the largest, opening to the nave, and one to each of the side aisles; over this screen the whole front of the cave is open to the air, one vast window the whole breadth of the same section, stilted so as to be more than a semicircle in height, or generally of a horse-shoe form.

The whole light, therefore, fell on the Daghopa, which is placed exactly opposite in the place of the altar, while the colonnade around and behind, is thus less perfectly lit, the pillars there being always placed very closely together, the light was never admitted in sufficient quantities to illuminate the wall behind, so that to a person standing near the door in this direction, there appeared nothing but "illimitable gloom."

I do not conceive that a votary was ever admitted beyond the colonnade under the front, the rest being devoted to the priests and the ceremonies, as is now the case in China, and in Catholic churches, and he therefore never could see whence the light came, and stood in comparative shade himself, so as to heighten its effect considerably. Still further to increase this scenic effect, the architects of these temples have placed the screens and music galleries in front, in such a manner, as to hide the great window from any person approaching the temple; though these appear to have been omitted in later examples, as in the Viswakarma of Ellora, and the two later Chaitya caves at Ajunta, and only a porch added to the inner screen, the top of which served as the music gallery; but the great window is then exposed to view, which I cannot help thinking is a great defect. To a votary once having entered the porch, the effect is the same, and if the space between the inner and outer screen was roofed, which I suppose it to have been, no one not previously acquainted with the design, could perceive how the light was admitted; supposing a votary to have been admitted by the centre door, and to have passed under the screen to the right or left, the whole arrangements were such, that an architectural effect was produced certainly superior to any thing I am acquainted with in ancient or modern temples.

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[1] Plates No. 3 and No. 8.

Something of the same sort is attempted in the classic and modern Hindu temples, where the only light is admitted by the door directly facing the image, which is thus lit up with considerable splendour, and the rest of the temple is left in a rather subdued light, so as to give it considerable relief. The door, however, makes but a clumsy window compared with that of the Buddhist cave, for the light is too low, the spectator himself impedes a portion of it, and standing in the glare of day, unless he uses his hands to shade his eyes, he can scarcely see what is within. In the Hypœthral temples, this was probably better managed, and the light introduced more in the Buddhist manner; but we know so little of their arrangements, that it is difficult to give an opinion on a subject so little understood.

Almost all writers agree, that the Pantheon at Rome is the best lit temple that antiquity has left us; in one respect it equals our caves, that it has but one window, and that placed high up; but it is inferior, inasmuch as it is seen to every one in the temple, and that the light is not concentrated on any one object, but wanders with the sun all round the building.

I cannot help thinking that the earlier Christian architects would have reinvented this plan of lighting, had they been able to glaze so large a space; but their inability to do this forced them to use smaller windows, and to disperse them all over the building, so as to gain a sufficiency of light for their purposes; and a plan having once become sacred, it never was departed from in all the changes of style and detail which afterwards took place.

Besides the great cave, there are, of course, a number of viharas attached to it; they are, however, all of them, small, and appear very insignificant compared with its splendour. This may perhaps be, and I am inclined to think is, an evidence of their antiquity; for the Viharas seem at first to have been mere cells, "where the Arhans sat to meditate," as Fa-hian expresses it, but to have become magnificent halls and temples as we find them at Ajunta, as the religion became more corrupt.

The principal vihara here is three tiers in height, (they can scarcely be called stories;) they are plain halls with cells, but without any internal colonnades, only the upper one possesses a verandah; the lower ones may, indeed, have been constructed with this usual appendage, but great masses of the rock above have given way, and falling down, have carried with them the whole of the fronts. There are no sanctuaries, and though there are one or two relievos of Buddha sitting in the lotus, and with his legs down, they do not appear to be integral or original parts of the design.

Still further are numerous similar excavations, and some fine cisterns filled with clear spring water; near one of these is a small daghopa much ruined.

There is a small vihara on the south side of the great cave, of the same character as those on the north, but owing to the fair and crowd, my examination of these caves was much more imperfect than I could have wished. There may be some that I did not enter, and peculiarities that I did not observe in those I did. From all I saw, however, I am inclined to rank them with the earlier caves at Ajunta, and though not perhaps quite so ancient as the Udyagiri series, they cannot be much more modern; which goes far to confirm the date I have above given to the great cave,

KANNARI.

These caves being well known, having been often described before, it will not be necessary to be so detailed in my description of them, as of the Ajunta series; though they are more numerous, amounting I should think to nearly a hundred in number, they are, on the whole, much less interesting than either Ajunta, Ellora, or Karli; the great chaitya cave being very similar, though very inferior to that of the last-named series, and presenting no peculiarity not seen in the other, while none of the viharas can compare with those of the first two, either in size or design, the greater part of them consisting merely of a small square cell, with a small verandah of two columns in front.

The whole of these caves are excavated in one large bubble of a hill, situated in the midst of an immense tract of forest country. Most of the hills in the neighbourhood are covered with the jungle, but this one is nearly bare, its summit being formed by one large rounded mass of compact rock, under which a softer stratum has, in many places, been washed out by the rains, forming natural caves, which slightly improved by art, have been appropriated as cells, some probably the first so used on the hill; it is in the stratum again below this, that most of the excavations are situated.

Approaching the caves by the usual route, the first you come to is the unfinished excavation figured and described by Salt, p. 47, Vol. I., Transactions of Literary Society of Bombay. It was intended, apparently, to have been a chaitya cave, though it has been left so incomplete that it is difficult to make out the plan; the outer porch, however, is nearly completed, and it is evident that it was not intended to have an outer music-gallery screen, like that which adorns its more ancient neighbour; and it presents but little of interest in its details, except, perhaps, that its external pillars are of the same order as those at Elephanta, and therefore probably mark it as a cotemporary example. On the whole it puts me much in mind of Lelat Indra Kesar ka noor more than any other cave I have seen, but they are both so unfinished that it is difficult to institute a comparison between them. It is, probably, the latest excavation of any importance attempted in the hill, and may date about the ninth or tenth century of Christ, probably even more modern than that.

Immediately beyond this is a group of caves, (containing among them the great chaitya cave of this series,) which I would willingly omit describing in detail, as that has been so well done by Mr. Salt, in the paper above referred to, but they contain so much that is interesting, and I may add, puzzling in their chronology, that I cannot pass them over; and to ensure greater exactitude, I shall try to combine his description with my own notes.

The first is a vihara consisting of a long irregular verandah of inferior workmanship, with cells opening at the back of it; but the point of greatest interest is, that it also contains two recesses or sanctuaries, in which stand daghopas. The three sides of the recess in which the most southern stands, are divided into panels, in which are carved one, two, or more figures of Buddha and of Bodhisatwas, in various attitudes.

Behind the northern daghopa, is a figure of Buddha seated on a Sinhasana or lion-throne placed on a lotus, the stalk of which is supported by two boys with hoods of cobra de capellos; from the stem of the lotus, two others spring, on which stand two youthful figures with chowries, and one with a lotus-bud in his hand; two flying figures above, and two priestly ones below, complete the tableau, which is found both at Karli and Ajunta, besides being frequently repeated here; but in no cave in any of these series, that could date before the third or fourth century of our era, unless, indeed, it is in such a position that it could have been added at any time. The verandah extends so closely up to the large cave, that only a partition of a few inches thick has been left between them, and which subsequently has been broken through, thus leaving an irregular hole by which you may pass from the one to the other.

The great cave[1] in almost every respect, resembles the great cave at Karli; it possesses the music-gallery screen in the same position and of the same form; and here it is still more evident, that the centre at least must have been roofed, but the roof could not have continued to the end, or it would have cut across the great figures of Buddha, twenty-three feet high, which occupy both ends: below where this roof would come, the wall is covered with sculpture, but in a very crude style of Buddhist art; indeed I do not know of a cave with anything so wretched.

The front of the cave above this roof is here quite plain and evidently not meant to have been seen; at Karli, though it must also have been nearly concealed, it is still ornamented with a series of niches; indeed, no part of that cave, seen or unseen, is slurred over as every thing is here; there is no trace of the wood-work which should have filled the great window, but over the top of the arch is a number of pins remaining; they seem, however, better fitted to hang curtains to, than to support wood-work, and I think must have been applied to the former purpose; but whether by the original diggers or not, it would not be easy to decide.

The dimensions of the interior are somewhat less than those of Karli, the total length being eighty-eight feet six inches, total breadth thirty-nine feet ten inches, the length and breadth of the nave being seventy-four feet two inches and thirty-nine feet ten inches respectively. The daghopa, forty-nine feet in circumference.

Very little of its wood-work remains, none on the daghopa, and on the roof only the tenons and battens to which the rafters were attached, and there are no remains of a screen in the great window.

The pillars that surround the nave are of the same order as those at Karli, but executed in the most slovenly manner,—the elegance of proportion is entirely lost. The figures on the capitals are much worse executed; the elephants here are in some instances employed in pouring water from jars they hold in their trunks, on daghopas, or on the bogaha, or sacred bo tree; and the boys with the snake hoods are also introduced. Only six of the columns, however, on one side, and eleven on the other, are so ornamented, and the rest were never intended to be so, as they are finished as plain octagons; which is another instance of the carelessness exhibited in this cave.

In front of the cave there is a court-yard of irregular form, (see accompanying plan,) the front being only thirty feet wide, and not parallel to the front of the cave, while immediately beyond the Silasthambas it is thirty-six feet, and at the vestibule of the cave itself is forty-six feet including the niches.

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[1] Plate No. 8.

It is extremely difficult to account for this irregularity, and the smallness of the court, which is quite inexcusable on any architectural grounds, and gives a poor appearance to the whole front. It could not have been caused by the form of the hill, as Mr. Salt supposes, and it was not till after long thought on the subject that what now appears to me to be the true solution of the problem occurred to me, namely, in the prior existence of the long vihara to the south, and of the little daghopa on its circular cave, marked E. in the plan, the whole interior surface of which is divided into panels filled with figures of the Buddha, similar to those described in the vihara on the other side of the great cave.

In describing the caves at Baug I mentioned the daghopas existing in the sanctuaries, apparently because there existed no chaitya have in the series; and believing this explanation to be the correct one, I was not a little surprised to find three daghopas existing here at the very threshold of the great Chaitya cave; and it was not till it occurred to me that they must have existed there before the great cave was begun, that I could account for the circumstance; the form of the court soon convinced me (after the idea was started), that this was the true solution: they are more ancient; and the spot having probably become particularly sacred, some devotee resolved on excavating a great temple between them; here, however, arose the difficulty. North and south, or at right angles to the axis of the hill, these caves are only thirty feet apart, and it was necessary to introduce a cave forty feet wide between them; this could only be done by commencing on the lesser dimension, and working back till he got behind them, where the cave was extended to the required width. It is quite evident that the long verandah of the southern cave never could have been allowed, had it been subsequently excavated, to approach so near the great cave as to endanger the wall breaking between them; for there is nothing to govern its length; it could have been as easily extended in one direction as the other; but the width of a chaitya cave governs all the other dimensions, and if the cave was to be of a certain class, it was necessary in the first place that it should have a certain width; and it was to obtain this it has encroached so nearly on its northern and southern neighbours. This will be more easily understood by referring to the accompanying plan.

Assuming this to be correct, we are at once met by a still greater difficulty than the one got over. When I first entered this cave, seeing its similarity in design and detail to the one at Karli, I at once concluded they were of the same age, and that the difference in execution was to be accounted for from the greater coarseness of the rock, and that it must have been designed by some provincial or inferior artist; and in every other case I know, this reasoning would have held good, for I know no instance in which an architect, Buddhist, Brahmanical, or Mahometan, has copied a building of a former age. Yet this cave seems to be the exception, and if I am not very much mistaken, it must be brought down to the ninth or tenth century of Christ.

It is also not a little singular that the execution of every detail should be so clumsy and bad; for though we find in the descending series of Buddhist structures a tendency to polytheism, and the fripperiness of ornament, I do not know any instance in which the figures and details are so bad as here, and this, too, at a time when Hindu art had scarcely passed its culminating point of perfection.

After proceeding some little distance to the northward from this group, and then turning to your right hand, you enter a narrow glen or gully, down which a strong mountain torrent pours during the rainy season. It is in the rocks that form the two sides of this glen that the greatest number of caves are situated.

The first you approach on your right hand is the so-called Durbar Cave, the finest vihara of the series, and the only one that can compete with the Ajunta ones in size; its dimensions are ninety-six feet six inches in length, forty-two feet three inches in depth, of course exclusive of the cells; the colonnade goes round only three sides, and the sanctuary occupies one intercolumniation of the inner range, as in number twenty at Ajunta. It is, however, too low for its other dimensions, being scarcely nine feet high, the pillars and plan of the same order as the Viswakarma at Ellora. The verandah has a range of eight plain octagon pillars, with pilasters. Below this is another cave, or rather series of cells, which give it the appearance of being two stories high, but there is nothing remarkable in the lower ones.

Immediately opposite there is an immense excavation, but so worn by the rain and torrent, as to look more like a natural cavern; and were it not for some fragments of columns hanging to the roof, and details in some more sheltered places, I should have supposed it to be such.

Proceeding upwards on either hand are some twenty or thirty excavations, but none worthy of particular description; some (two I think), contain daghopas, the rest are small viharas, with one or two cells and verandahs, the pillars of which are generally either entirely washed away, or very much worn, the material being soft laterite or breccia, little better than hard gravelly clay.

The first cave in this direction has some of its pillars the same as those of number seven[1] of Ajunta, and which I have seen nowhere else; it has also the cushion pillars of Elephanta. From its position, and also from the gradual progress of style in these caves, I feel inclined to think this one of the most modern, and all below it consequently more ancient, and therefore probably coeval with the group of the Ajunta series, described as numbers sixteen and twenty.

Above these, on the south side, under the brow of the hill, is another series of viharas. They are small, but some of them, especially three, very interesting, from the walls being entirely covered with sculpture, of very fair execution; the general design of which is a Buddha seated on a lotus, the same as already described as placed behind the northern daghopa in the long cave; this is repeated here with almost no variation, and its style is so similar, that it certainly represents a form of religion and art that must be very nearly, if not quite cotemporary.

The general size of these caves is from twelve to fifteen feet square; one, however, that I paced, was about forty feet square, without pillars. It was covered with sculpture, but strange to say, there was no sanctuary, but merely one large standing figure of Buddha opposite the entrance. There were cells as usual, and benches round the sides.

It is not very easy to decide whether these caves are more modern than those below; on the whole I am inclined to think they are, though their age cannot differ much; and if so, the Kannari series will be arranged as follows: first those in the ravine, in the fourth or fifth century; those last described with those on each side of the great cave, probably at least a century later; then the great cave; and, lastly, the unfinished one first alluded to.

They may thus be considered one of the most modern of the Buddhist series in India. Indeed, I am inclined to think that the greater part of them at least were executed by a colony of Buddhists, who may have taken refuge here after being expelled from the continent, and who have tried to reproduce the lost Karli in their insular retreat.

Some remains of plaster and painting exist in almost all these caves, though from the porous nature of the stone through which the water must percolate during the rains, the vestiges are small, and I could not find one complete figure in any; owing to this cause no vestige of either exists on the roofs, but only on the walls in the less exposed situations. The porosity of the rock, however, has enabled the "good monks" to furnish themselves with a copious supply of delicious water; almost every cave is furnished with a cistern or well, which even at the time of my visit in April was nearly full, though no rain could have fallen for months. Nothing of the kind exists at Ajunta, but the stream with its koonds, supplied the deficiency there; at Karli, Ellora, Elephanta, Khandagiri, and even at Gwalior, these cisterns are to be found cut in the rock, in the vicinity of all the temples and viharas.

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[1] I am not quite certain this should not be number twenty; the note was made at Salsette, and I fear the drawing was wrongly numbered: for the context it is immaterial which.

Most of the principal Buddhas in this series sit with the feet down, only the smallest ones with their legs crossed; and very often the principal figure of a group, apparently a Bodhisatwa, is a standing one, with a high head-dress I have not remarked elsewhere, and attended by two women with chowries; the true Buddha is, I believe, always attended by men.

A good deal of masonry exists on the hill as the supporting walls of terraces, which have been formed in front of all the different series of caves, and no doubt were formerly planted with gardens, as those at Gwalior now are; and they probably existed at the other series, but have now been destroyed. The view from the upper series of terraces is very fine and interesting. On the slope above the cornice of some of these caves mortices are cut in the rock, and are evidently footings for wooden posts which may have been used to support a decoration of some sort, but more probably an awning or screen to shelter the front of the cave from the sun.

DHUMNAR.

About forty miles south-east from Neemuch, and one from the village of Chundwassa, are situated the series of caves which I will now proceed to describe.

In themselves they are small and comparatively uninteresting, and were it not for the existence of the Brahmanical rock temple behind them, would not deserve much notice; but as this was the first thing that made clear to me the distinction between Buddhist and Brahmanical rock-cut temples, and will assist in explaining the more splendid ones at Ellora, I must give such details as will enable others to understand my own impressions on the subject.

The hill of Dhumnar, like all the other hills in the neighbourhood, consists of a flat plateau of rock, surrounded by a perpendicular cliff, from the bottom of which a mass of debris forms a talus, sloping down to the plain ; in the present instance the cliff is nowhere higher than twenty feet, which necessarily circumscribes the dimensions of the caves, to keep within it, thus rendering them the most diminutive series I know of in India ; and besides, the rock is the most unfavourable that can be conceived for the exhibition of sculpture, the whole hill consisting of a coarse iron-stone or laterite, very similar to that of Cuttack, but here of a coarser grain than I ever before saw it.

At the bottom of the cliff a broad terrace has been formed, which still exists tolerably entire, at the end of which you enter laterally into the so-called "Child's Cave." Here the daghopa stands in the centre of a small court, in the open air ; immediately behind it is the cell or sanctuary, in which is a figure of Buddha sitting cross-legged, with a male attendant on each side of him ; the cell is isolated by a covered passage running round it, one side of which is occupied by a recumbent figure, about ten feet long, in the same attitude as the larger one in the most modern chaitya cave at Ajunta, described above ; behind are three Buddhistical figures, sitting cross-legged, probably Bodhisatwas, or of the predecessors of the great occupant of the sanctuary. A smaller figure stands between each of these, and three more stand on the third side of the passage, probably disciples.

The next in importance is Bheem Sing ka Bazaar. It is a chaitya cave, with vaulted and ribbed roof of the usual form and detail, but here only about thirty feet deep by fifteen wide, and without side aisles. There has been a porch nearly square in front of it, but the roof has tumbled in, and now encumbers the entrance. The rock in which this cave is cut is, as in the former instance, isolated by a passage running round it; round two sides of this passage, and a small portion of the third side, there runs a square colonnaded verandah, from which open a number of small cells, thus forming a combination of a chaitya cave with a vihara, which I never saw before. The pillars were evidently intended to have been carried round the third side, but it has been left unfinished, which does not say much for its antiquity.

The next three in importance are the great and little Kutchery, and the Ranee's Abode[1]. They have all semicircular domed recesses at the inner end, with daghopas. One has a rib-vaulted roof like the bazaar, but the other two have square flat roofs divided into nine compartments, and supported by four pillars.

The other excavations are of no great extent, being merely cells from six to ten or twelve feet square, with the usual verandah in front; but the extreme coarseness of the rock seems to have precluded even the quantity of ornament being bestowed on them, that is usual in other series.

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[1] These names are taken from Colonel Tod's description of these caves in his Journal.

Counting those only commenced, and even the merest scratchings in the rock, there may be from sixty to seventy caves altogether. I could not count so many, and where therefore Colonel Tod found his hundred and seventy caves I am at a loss to conceive.

It is very difficult to form an opinion as to the age of these caves, as it has been impossible for their architects to express or define their details with any exactitude in such a pudding-stone. I have, however, no doubt that the whole were at one time plastered, and that what is now seen is merely the coring; but here again the badness of the material, by allowing the water to soak through, has peeled off every vestige of the decoration, and the figures seem to have gone through a second attack of the small-pox, which has disfigured them to an extent almost ludicrous.

As far, however, as I could judge, they must all be very modern. The similarity of style and execution in the Child's Cave to number twenty-seven of Ajunta, convinced me that they were of the same age; and in the whole of them there is want of that simplicity and majesty which distinguishes the earlier Buddhist works, and a tendency to Jainism, which exists only in the latest caves; and what architectural details I could make out by looking at them from a distance, all went to confirm this impression.

About fifty paces from the edge of the cliff, in the centre of the plateau, a pit has been dug, I thought of about fifty paces by twenty, and about forty-five feet deep. Tod, however, says a hundred feet by seventy, and thirty-five deep, (and he probably is more correct, as, contrary to my usual custom, I omitted to measure it): towards the west end of this pit a temple has been left standing; the top of the Sikra or spire being level with the plateau above. It differs in every respect from those already described, being in fact merely a model of a Brahmanical structural temple, with all the accompaniments usually found in them. Indeed, externally, the temple very much resembles those at Barolli, described by Tod, and which I had just visited. The vimana is almost a fac-simile, as far as the material would allow, though the mantapa or porch is slightly different in form, and larger in proportion. In the sanctuary is a black marble statue of Vishnu, well executed, and with all his usual attributes, and on the floor in front of him a large well-oiled Lingam, which evidently is now the principal object of worship, indicating a change of masters I have several times seen in these parts.

Around the large temple are nine smaller shrines, each of which had contained a piece of sculpture; but only three are now so occupied. One, a tablet, with six figures very much defaced; another, Vishnu reposing on the Seseja; and the third, a series of the ten avatars, but with this singularity: that here the ninth, instead of being Gotama, as in every other of the series I had then seen, is Chaturbuj himself, with his gadhi, chakra, and all his usual attributes.

In front of the temple, a long level passage, cut through the rock (a hundred and ten paces long,) leads to a valley or depression in the plateau, and was evidently formed, not only to afford a level entrance to the temple, but to allow the rain-water to drain off, which otherwise would have stagnated in the pit.

It is not very easy to understand why this passage was not brought out through the scarp, and thus access given to the temple from the plain. Perhaps it arose from an unwillingness to destroy the caves, which would have been necessary had that been attempted; and the Brahmans, unlike our northern reformers, never seem to have been destroyers. Perhaps, also, it may have arisen from the necessity of placing the temple east and west, and a consequent desire to approach it in front, and not at right angles.

The Brahmans never, it appears, were cave diggers; and when, in the struggles with the Buddhists, they thought it necessary to engage the prejudices of the people on their side, by adopting this most popular and splendid way of erecting places of worship, nothing can be more clumsy, and if I may use the expression, unnatural, than the way in which they set about it. They either copied Buddhist viharas, but without the cells that gave them meaning, and covered the walls with sculpture, which, owing to the badness of the light, they were ill-fitted to display; or, what was worse, they copied in the rock, (as in this instance,) their own structural temples; but thus necessitating their being placed in a pit, which quite destroyed their effect. Had they always been able to find isolated rocks, as they did at Mahavellipore, this remark would lose much of its force; but both the Kylas at Ellora, and this temple, are deprived of half their effect from this cause.

The Buddhist temples, on the contrary, are always in good grammar; they are all interiors,—really caves,—and with only such external ornament, such as verandahs to the viharas, and framings to the great window in the chaitya caves, as were always in good taste, and the purpose and meaning of which was at once seen. There is no instance of a Buddhist copying an exterior, as is here the case, or any building not a cave.

The similarity of this temple to that at Barolli also enables me, at least approximately, to determine its age; for I have made up my mind, for reasons which I cannot enter on here, that the former was erected in the eighth or ninth century after Christ. This probably was coeval. The sculpture, too, though executed in rather a coarser material, (fine hard freestone,) here is very similar in design and execution.

ELLORA.

I have put off speaking of Ellora to nearly the last, not only because it contains some of the most modern cave temples of India, but because it is the most complicated series I am acquainted with, containing examples of almost every kind, except, perhaps, the most ancient, and therefore demanding more knowledge of the subject to understand it, than any other series; and also, because, as being the best known in Europe and the one generally quoted for its unknown antiquity, I shall have to contend more with preconceived opinions than when speaking of the others. Its having been so often described, however, will enable me to be more concise and say less on the subject than I should otherwise have been obliged to do.

It is usual for travellers to be awe-struck on first approaching "this vast amphitheatre of rock-cut temples." It is, however, the principal defect of this style of building that it makes so little appearance outside. Some of the Vihara caves have fine fronts, but being either as a cliff as at Ajunta, or Karli, they bear much the same proportion to the rock as a window does to a house side, and therefore lose any appearance of size, or they are excavated on the sloping side of a hill as at Ellora, and can only be seen directly in front; the Viharas are never fine externally, and here less so than usual, owing to the sloping nature of the hill; and the Kylas is absolutely invisible from the exterior. Indeed, a man might ride along the whole front, and at a few hundred yards' distance, and, unless previously warned, never be aware that he was in their vicinity.

To convey to the European mind a still greater impression of their magnificence, it has been asserted more than once, that they are cut in hard red granite, whereas, the rock is the usual trap formation of this side of India, a sort of porphyritic greenstone or amygdaloid, I believe; but whatever it is, certainly as soft and as easily worked a material as could well be used for architectural purposes.

The amphitheatre of rocky hill in which they are situated cannot be less than two or three miles measured on the chord; and the caves are scattered over a distance about a mile and a half. Sir Charles

Mallet says, one mile from the Indra Subha to the Viswakarma in a direct line; this great space takes very much away from the effect when viewed as a whole; and it is only when in the courts of the caves, or when studying their details, that you are aware of their greatness or magnificence.

In describing these caves most travellers commence with the most northern group, the Jugganath Subha, and proceed to the most southern, the Viswakarma group; both Sir Charles Mallet and Colonel Sykes follow this plan, and the guides invariably take the traveller to the most northern first, so that if the notes are commenced on the first inspection, they almost certainly take this direction. Seely is almost the only exception I know to this rule, and he plunges at once "in medias res," and describes first the Kylas, and then the others indiscriminately.

The true way, however, to describe this series (which as far as I am aware no one has followed,) is to commence from the southern extremity, where the Buddhist group exists, and, consequently, the most ancient caves of the series, and the gradation is then easily perceived by which they passed into the Brahmanical, which, after rising to its glory in the Kylas and Doomar Lena, again for a short time passed into the half-Jaina group of the Jugganath Subha, and ended there.

I regret much that my notes on these caves are not more full than they are; but having read detailed descriptions by such men as Sir Charles Mallet, Colonel Sykes, Seely, Wales, &c., I thought nothing remained undescribed, and merely noted what bore directly on the subject of my researches; and the volumes that contain these descriptions being much too bulky to be carried about, it was not till too late that I discovered how much, particularly among the Buddhist temples, remains to be known, and described.

The whole series of Ellora consists of about thirty excavations, of which ten are Buddhistical, fourteen Brahmanical, and six belong, properly speaking, to neither of these sects, and they can scarcely be in strictness ascribed to the Jains, though savouring more of their religious tenets than of either Brahmanism or Buddhism.

Of the Buddhist group the principal cave is the so called Viswakarma, the only Chaitya cave of the series; it is neither so large as those at Karli or Salsette, being only forty-three feet wide internally, by eighty-three feet one inch in length, nor is it so rich in its details as the two later Chaityas at Ajunta. Still it has beauties of its own which render it highly interesting; its exterior court-yard (a square of about seventy feet with a handsome colonnade on three sides,) and the simple lines of the front form to my eye a more pleasing exterior than that of any of the others, at least at present, though it is impossible now to judge of what their effect may have been when their galleries and wooden decorations were complete.

It differs from all others in having what we would call a triple or Venetian window in the centre, which externally is certainly more pleasing than the great arch in the others; but that as I have suggested above was probably not seen from without, and internally, this cave is certainly worse lighted than the others; though in such a climate its gloom can scarcely be called a defect.

Internally the design of the temple is marked with considerable elegance and simplicity; the two pillars that support the gallery over the entrance are rich and handsome; the twenty-eight others are simple octagons, changing in one part to sixteen sides, and of great elegance.

The sculpture in the panels of the triforium belt disappointed me, but under the springing of each of the stone ribs of the roof is a corbel figure, alternately male and female, all the males having the snake hood, which the females have not

In front of the daghopa is Buddha sitting with his feet down, with an attendant on each side, and over his head are a number of flying figures, only found in the most modern Buddhist caves, and savouring much more of Brahmanism than the pure worship of Sakya Muni; there is no trace of painting or stucco on the cave, though the side walls of the aisles being left rough, look as if that had been intended by the original excavators.

Though the form and ordinance of this temple are purely and correctly Buddhistical, the sculptures deviate strangely from the usual forms adopted by that sect; standing, for instance, in the court-yard, you do not see any figures of the deified, no cross-legged Buddha, or Bodhisatwa, except in a very subordinate position; and on the contrary, the sculptures generally consist of pairs of figures, male and female, as seen in Brahmanical temples, and in one group in no very decent attitude, the only instance I am aware of anything approaching to indecency in any temple of this sect; internally the same is the case; and it is indeed, too evident, that the pure religion of Buddha had deviated much from its primitive simplicity before this cave was excavated, and that it was already verging fast to that which succeeded it; a circumstance which alone would be sufficient to bring down its date to a very modern time; but the details of its architecture afford more certain means of comparison, and place it somewhere between the two most modern Chaityas at Ajunta; it may be as old as the one, or as modern as the other; but it cannot, I think, under any circumstances, be placed higher than the sixth or seventh century of our era, and I would not bring it down lower than the eighth or ninth.

There are numerous Viharas attached to this great cave, the principal of which is the great Dehrwarra, one of the largest excavations of the class that I know of; being about one hundred and ten feet by seventy, including the side recesses; it is, unfortunately for effect, very low, and its details are by no means to be compared to those of a similar age at Ajunta. It is probably of the same date as the Viswakarma; if any thing, more modern.

Close to the great cave is a small and very pretty Vihara, in which the sanctuary stands free, with a passage all round it, as in some of the Sivite caves further on; and the appearance of the warders on each side of its door would lead one rather to expect an image of Siva inside than the Buddha which actually occupies it. The details, however, of its architecture are the same as in the Viswakarma.

Communicating with this one, is a small square Vihara, the roof of which is supported by four pillars of the same detail as the Dookyaghur, the cave next it on the north; but though surrounded by cells it has no sanctuary or images.

Higher up the hill than these are two others containing numerous cells, and one with a very handsome hall, the outer half of which has unfortunately tumbled in; enough, however, remains to show not only its plan, but all the details, which very much resemble those of the last group of Viharas at Ajunta.

In the sanctuaries of most of these caves are figures of Buddhas sitting with their feet down. On each side of the image in the principal one, are nine figures of Buddhas, or rather Bodhisatwas, seated cross-legged, and below them three and three figures, some cross-legged, and others standing, probably devotees, and one of them a woman.

Neither of these caves have been entirely finished.

There is still another group of these small Viharas, called the Chumarwarra, or, (if I understand correctly,) the Chumars' (or shoemakers') quarter. The first is square, with twelve pillars on the same plan as those at Ajunta, though the detail is similar to the Viswakarma. There are cells, and in the sanctuary Buddha sitting with the feet down; it never has been finished, and is now much ruined.

The second is similar in plan, though the pillars are of the cushion form of Elephanta and the Dehrwarra, but the capitals are much better formed, than in the last example, and more ornamented; the lateral galleries here contain figures of Buddha, all like the one in the sanctuary sitting with their feet down, and there are only two cells on each side of the sanctuary.

The last is a small plain Vihara with cells, but without pillars, and much ruined.

The whole of the caves in this group resemble one another so much in detail and execution, that I am unable to make out any succession among them, and it is probable that they were all excavated within the same century as the Viswakarma.

The next three temples I have to describe are particularly interesting to the antiquarian, as pointing out the successive steps by which the Buddhistical caves merged into Brahmanism. As they have been so often described, I need not repeat the description here, but assume that their form and detail are known.

The first is the Do Tal, or Dookya Ghur, a Buddhist Vihara of two stories; most of its details are so similar to those above described, that it may be assumed to be without doubt of the same age; it is strictly Buddhistic in all its details, and shows no more tendency towards Brahmanism than what I pointed out in speaking of Viswakarma. It apparently was intended to have three stories, but has been left unfinished.

The next, or Teen Tal, is very similar to the last in arrangement and detail, and its sculptures are all Buddhistical, though deviating so far from the usual simplicity of that style, as almost to justify the Brahmans in appropriating them as they have done.

The third, the Dasavatar, is another two-storied cave, very similar in all its architecture and details to the two preceding, but the sculptures are all Brahmanical. At first, I assumed, that the excavation had been made by the Buddhists, and appropriated and finished by their successors. This may be true to a certain extent, but on a more careful examination I am more inclined to think we owe it entirely to the Brahmans. It it evidently the earliest Brahmanical temple here, and it is natural to suppose that when the Sivites first attempted to rival their antagonists in cave temples, they should follow the only models that existed, merely appropriating it to their own worship. The circumstance, however, that makes me most incline to this opinion, is the existence of a pseudo-structural Mantapa, or shrine of Nundi, in the court-yard; this evidently must have been a part of the original design, or the rock would not have been left here for it, and it is a model of the usual structural building found in Sivite temples in different parts of India. And as I pointed out in speaking of the Dhumnar caves, this is a piece of bad grammar the Buddhists never were guilty of; their excavations always are caves, whilst the characteristic of Brahmanical excavation is to copy their structural buildings, a system which rose to its height in the Kylas, which is the next I shall have to describe.

After the successful attempt at a small rock-cut model of one of their own temples, it is not wonderful that the Brahmans should attempt something of the same class on a larger scale, though some powerful motive must have existed to induce them to attempt any thing so splendid as the Kylas.

In it there is no trace of the forms or ordinances of the caves I have just been describing; every thing is Brahmanical, every thing is copied from structural buildings; and had it been cut out of a rock on a plain, (its proper situation,) no stranger would have suspected that it was a Monolith, without at least, a most careful examination of its structure.

If, as I suppose was the case, it was undertaken to mark the triumph of the Sivites over the Buddhist faith, it was a noble idea; and whatever faults may be inherent in the design, we owe to it not only the most splendid excavation in India, but we are also fortunate in possessing a record of the architecture of its date in so imperishable a form, and which may hereafter help us to make important historical deductions.

The greatest fault inherent in the design is the situation in which the Kylas stands, being literally, as at Dhumnar, a temple standing in a pit. From this circumstance, the gateway, or gopura, and screen in front, entirely hide the temple from view outside, and when in the interior court the space is so confined, that the spectator can never get to a sufficient distance to get a good general view, and look what way he will he has always the perpendicular scarp of the pit, higher than the temple itself.

When I first approached the Kylas, it was after a long journey, during the course of which I had visited almost all the Hindú remains between Jaganath on the shores of the Bay of Bengal, and Mount Abu on the borders of the western desert; and I had acquired such familiarity with the style and details of Hindú architecture, that I felt convinced I should at once be able to synchronize this wonder of Ellora with some of the temples I had seen, and even perhaps to affix a date to it. The first glance however undeceived me, as the style was totally different from any thing I had seen, and one might as soon attempt to fix the date of a Gothic cathedral, from having acquired an intimate knowledge of the classic styles. Unlike the temple at Dhumnar, which is an exact copy of the structural buildings in its neighbourhood, this belongs to a southern type, and that type I had not then had an opportunity of seeing or examining; and as I have often said, there are no drawings extant of Indian buildings which will enable an antiquarian to make the comparison without personal inspection.

It was not till the spring of the present year that I was able to complete my survey of Hindú architecture by a tour in the Carnatic, and it was then at Tanjore and Chillumbrum that I found the type I was looking for. It would perhaps be going too far to assert that the builders of the great pagoda at Tanjore were the excavators of the Kylas; and it would certainly take up more time and space than I can afford here to attempt to prove it; but so strong is the evidence, not only from the similarity of styles but also from history, (I should rather say tradition,) that I have no doubt in my own mind, that the Chola, or at least, some of the Karnata Rajas were the excavators of this temple, and the restorers of Sivite worship in the Dekkan; my own impression is, that we must ascribe this to either Raja Rajendra or Keri Kala Cholan, and that consequently the date given by Meer Ali Khan to Sir Charles Mallet is very near the truth, if applied to this excavation, at least, and that it was made in the first half of the ninth century of our era.

The external gateway is exactly one of the gopuras which adorn all the temples of the south, and are unknown in the north; whether it had ever the pyramidical top with which all these are adorned it is not very easy now to determine. I am inclined to think it had, but if so, it would be of brick, as all those are, though their base is universally of granite, to the height at which this one of the Kylas remains.

The colonnade which surrounds the area in which the temple stands, is of course more modern than the temple itself; probably considerably so, as the style is different, and resembles more the northern style than any thing in the temple itself, so much so indeed, that it would almost seem as if the architects had reverted to the familiar types of the caves previously described, after the retirement of their southern friends.

Of a still more modern date is the beautiful temple of Lanka in the northern scarp of the rock, to which I shall revert presently, and to a later date than even this would I ascribe the two-arched Buddhist-looking excavation on each side of the entrance, one of which, that of the north, is only commenced, that on the south nearly finished. It is possible they may have been placed there with the idea of conciliating the Buddhists by the first designers of the temple, but I consider it as much more probable that they have been added at some time, when, for a short interval, the Buddhists may have had the upper hand, and consequently possession of the temple.

I should also mention, that the Vimana itself is the only thing here of a purely southern type, its adjuncts are less so; and the caves, both on the north and south sides, have much more affinity with the northern styles, than with those found on the south of the Kistna.

The next six caves proceeding north, have been so often and so well described, that I may be excused saying much about them; they are usually called the Rameswara, Neelcant, Teeli ka kanah, Kumarwarra, and the two Chendwassas.

They are all very much on the same plan, and all singularly like small Buddhist Viharas at first sight, so much so, that after being convinced they were Brahmanical, I still clung to the idea that they must be appropriations; but this idea must be abandoned, for they are all without cells, and there are arrangements about them never seen in Viharas; and had they been once used by the Buddhists it would have been impossible, in a rock temple, to obliterate the marks of their former destination. Imitations they certainly are, and this is perhaps all that can be said of them; though it is difficult to understand why the Brahmans should have imitated the Buddhists, unless it was (as before suggested) to conciliate the followers of the latter religion, by allowing them to worship the new gods in rock-cut temples, similar to those in which their fathers had worshipped before them.

The architecture of all these temples is of a northern type, and resembles, with some variation, details found in the caves to the south of the Kylas, and at Ajunta, though differing in some respects to suit the two different religions to which they are dedicated.

The Rameswara is the most complete, and its sculpture the best of any temple here, though much in the same style as those surrounding the Kylas.

The most northern of the two Chendwassas is the only Vaishnava temple here, and at the same time the one that looks most like an appropriation, for it has cells, and the sculpture seems to have been interpolated on the original design. The sculpture, however, is so bad that the whole may belong to an age very much more modern than the others.

The next to be described is the Doomar Lena[1], the finest and largest Brahmanical cave excavation here. From its plan and details, there can be no doubt that it was as purely Brahmanical as the Kylas. The plan exactly resembles the Chaöri, or nuptial hall, such as those in front of the great temple at Barolli, and also the one in the fort at

[1] Plate No. 4.

Kumulmair; and if I am correct in translating Chaöri as nuptial hall, as Tod does, the appellation Doomar Lena here given, is the correct one, and not merely a trivial name, derived from one of the sculptured groups, as usually supposed. Indeed, had that been the case, they would hardly have used the Pali word Lena. The only difference between this, and the structural Chaöris, is that here the temple or vimana is inclosed in the cave, while at Barolli, and elsewhere, the Chaöri stands in front of the temple. The same thing occurs in Buddhist architecture, for in all Buddhist countries we find the daghopa outside, and near the temple: in the caves it is placed inside.

Though the architecture of this cave is finished, the sculpture does not seem so complete as at Elephanta, a cave which this one singularly resembles in every respect, both of size, plan, and detail; this, however, is the largest, being a hundred and fifty feet each way, while the other is only a hundred and thirty, and its details are somewhat better finished; though the pillars are so much alike, that it requires drawings made on the spot to detect the difference between them[1].

The sculptures, too, seem intended to have been nearly the same, and on the side of the entrance we find the same figure of Buddha, or, as the people call him here, Jam Dhurm, the Dharma Raja, which puzzles the antiquarian at Elephanta. I can only ascribe his presence to the same system of conciliation which induced the Brahmans to go out of their way to dig these caves at all.

This temple, with the one at Elephanta, if I am correct in the views I have stated above, must have been excavated in the tenth century of our era, a date which I do not think can possibly be far from the truth.

In a nullah above this are several small caves, containing Trimurti busts, and one also exists near the Kylas. They are not remarkable for any thing else, and what I have to say of the busts in question had better be deferred till I come to speak of Elephanta.

There are two caves which I have passed over in the above enumeration, so as not to break the chronological sequence in my description. The first, the Ravana ka Kaie, (Ashes of Ravana,) is situated between the Teen Tal and Das Avatar, but lower down in the hill, and has few points of similarity with those on each side of it. It is a purely Brahmanical cave of a florid style of architecture. In form the pillars resemble a good deal those that surround the court-yard of the Viswakarma, though more ornamented, and it is here that first appears the vase and falling leaf, so common, afterwards, in the temples of northern India. The sculpture is good, and similar to that of the Rameswara in many respects. I have however described it by itself, as there is no cave in Ellora whose relative date I found so difficult to determine. It may possibly belong to the position it holds locally in the series, and would be thus the earliest Brahmanical cave here, and the similarity of its pillars to those of the Viswakarma, rather favour this supposition; but its floridness, the style of sculpture, and the general disposition of the cave, incline me to place it much later, or, as here described, after the Doomar Lena.

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[1] Plate No. 9.

The other cave is called Lanka, and is situated above the colonnade in the northern scarp of the Kylas; from its position evidently executed subsequently to the great temple, and, from its design, I should think not less than one or two centuries later. Its details all belong to the northern styles, and are bold and good; indeed, as a specimen of cave architecture, I consider it the finest and best designed in the whole series. The pillars, which would be clumsy and heavy in a structural building, are elegant and appropriate when viewed in conjunction with the mass of rock they support. There are very few sculptures, and these are not remarkable either for execution or design. Indeed the cave does not seem to have been entirely finished, or every compartment would, without doubt, have contained some group of sculpture.

The next caves to be described are the Indra Subha group, consisting of four principal caves, and several smaller ones.

In their architecture they differ very considerably from those already described, being generally more ornate, the pillars shorter and more massive, and a species of leaf falling over a vase being here introduced, which does not occur in any of the earlier examples; though something of the kind is seen as above mentioned, in the Ravana ka Kaie, and in the Lanka; indeed the style of the last-named cave so completely resembles that of the Indra Subha, that I have no hesitation in placing them nearly in the same age, though it would be difficult to say which is the more modern.

The sculptures to this group have hitherto proved a stumbling-block to antiquaries, and no fixed opinion seems to have been arrived at regarding them. Buddhist they certainly are not, or at all events of so degenerate a type as scarce to deserve that name; nor are they Brahmanical; and though they certainly resemble Jaina sculpture more than any other, I do not think they can be correctly ascribed to that sect either, at least as we now know it. In no place in these caves do the twenty-four thirthankars appear, nor have the cross-legged figures the symbols which almost invariably accompany these worthies, and are the only means of distinguishing one from another. If, however, I am correct in supposing Jainism to be a sort of compromise between the other two religions, which did not acquire its present form and consistency till after the downfall of the Buddhists, when they were joined by most of that sect who had not embraced the dominant religion, these caves are doubly interesting as showing us the religion in a state of transition from one set of tenets to another.

Be this as it may, I have little doubt that they are the last caves executed here, and I do not think their date can be carried higher than the eleventh or twelfth century of our era. Indeed, from a similarity in some of the details, I would feel almost inclined to ascribe them to Raja Indra Dyumna, who plays so important a part here, and in the building of the famous Jaganatha Pagoda, in Orissa, in the twelfth century; but it would require more knowledge and labour than I can at present apply to the subject, to make out whether this be really the case or not[1].

There is one singularity in these caves that I am unable to explain, which is the form of the pseudo-structural temple in the court yard, in front of the Indra Subha. Like the Kylas, it seems to have come from the south, while the details all round it belong to the northern types; and though its age would by no means interfere with the date given above, its appearance here is singular, and its detail still more so. The difficulty will perhaps only be solved by a more attentive examination of the structural temples of the Dekkan than I have been able to make.

ELEPHANTA.

The great cave at Elephanta has been described so well, and in such detail, by Mr. Erskine, in the Transactions of the Bombay Literary Society, that I may be excused saying much about it.

The rock here is much harder than at Ellora, and all the details are consequently cut with more precision, and better preserved, than in the caves there; but neither the outline nor general design are better than in the sculpture of the Hindu series there.

The great cave, as I said before, is of the form now called a Chaori, and differs from the one at Ellora only in the position of the Ling chapel, or sanctuary; and the great Trimurti bust, which may have been intended, in the Doomar Lena, for the space opposite the entrance, is there left blank, though the position of the sanctuary renders this improbable. The great bust is now generally allowed to be of Siva alone, and I will not add anything to the discussion, further than by mentioning that at Barolli there is a bust of large dimensions, and almost exactly similar to this; but being cut in fine hard stone, all that remains of it is more easily distinguishable than here. The centre face, however, is unfortunately entirely defaced, but that on its right has a chaplet of skulls, and the "frontlet eye" open, and an angry and animated expression of countenance. The face on the left has also the frontlet eye distinctly marked, but as no eyeball is shown, I presume it is meant to be represented as shut; but what adds particular interest to this bust is, that over it, on the same stone, are full-length statues of Brahma and Vishnu, the former over the right face, with his three (query four?) faces, and his Vahana, the goose, the latter as usually represented, with his four arms, and the gadhi, chakra, &c., circumstances which quite put to rest the idea of the bust itself representing the three persons of the Trinity, nor can I concur with Colonel Sykes in supposing the left face to be Parvati. The three I believe to be Siva, as creator, preserver, and destroyer; an assumption of the attributes of the other two ascribed to him by his votaries when his worship became dominant.

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[1] See Introduction to Wilson's Catalogue of Mackenzie's MSS., p. cvi.; also, Asiatic Researches, vol. xv., p. 316; and Dr. Buchanan Hamilton's Statistics of Bagulpur, p. 23.

In a ravine running from the great cave across the island, there are two other caves, similar in plan to those situated between the Kylas and Doomar Lena, at Ellora. These unfortunately, however, are so much injured by the falling of the rock and the damp, that it is impossible to make out more than their dedication to Siva, and a general similarity to those of Ellora, with which I have no doubt they are cotemporary: indeed there is a degree of similarity between the two series which is singular in structures so distant, and which can only be accounted for by their being undertaken at the same time, and probably under the same direction.

I could find no trace of Buddhism in the whole island, and these, therefore, are perhaps singular, as being the only purely Brahmanical series in the north of India; for though those at Joyghesir and Montpezir are likewise purely Hindu, and apparently of the same age as these, they are situated in the same island, and so nearly in the vicinity of the great Buddhist series of Kannari, that the motive before ascribed, as inducing the Brahmans to become cave diggers, applies to them.

MAHAVELLIPORE.

One only series remains now to be described, and which, though not so magnificent or extensive as some of those which have already passed under review, still possesses peculiarities and distinctive features, which render it scarce less interesting to the artist or the antiquary.

Like Ellora, however, it has been so often described by Europeans, that little remains to be added to what has been already published on the subject, first by Messrs. Chambers and Goldingham in the Asiatic Researches, and afterwards, with more precision, by Mr. Babington, in the Transactions of the Royal Asiatic Society. The notices of Bishop Heber and Mrs. Graham are also interesting, though not bearing on the present subject of inquiry.

Between Covelong and Sadras, a long sandy ridge extends near forty miles, bounded on the east by the sea, and on the west by a salt-water lagoon, now dry for the greater part of the year. Towards the southern extremity of this ridge, a number of masses of granite rock protrude through the surface, so numerous and large in one spot as to form a hill about a mile in length, with half that breadth, and rising to the height of about a hundred or a hundred and fifty feet; and it is in this hill that the principal antiquities are situated, consisting of some half-dozen of caves in various states of progress, one pseudo-structural temple, and the famous bas-reliefs. About half a mile to the south of this, are the five raths, and on the rock jutting into the sea, due east from the centre of the hill, the famous structural temple, known as the remaining one of the seven pagodas, from which the place takes its European name.

The most completely finished cave here, (for none is entirely so,) is the small one in the ravine, figured in Babington's ninth plate. It is architecturally complete, though its sculpture is not quite finished. The finest cave, however, is the one containing the fine bas-relief of Kali killing Mahaasura, (see plate 4 in Babington's description) by far the finest piece of sculpture here, and equal to anything at Ellora. The frontispiece of this cave, however, is merely blocked out, and its cells are unfinished. Like the others it is small when compared with the northern caves, being only thirty-two feet ten inches, by fifteen feet six inches, in the interior, exclusive of the three cells; the centre one of which is occupied by Siva sitting on Nandi, with Parvati and Sobramuni, and above them Brahma and Vishnu. In form and detail this cave may be compared to the Rameswar at Ellora, or perhaps rather to number seven at Ajunta. It cannot, however, be so old as either of them, as the architecture is poorer, leaner, and its details resemble much more those used in structural buildings of a more modern date than the massive style of cave architecture that distinguishes these specimens[1]. That it is a copy from these caves can scarcely I think be doubted, but not one of the same age.

Immediately above this cave, and apparently intended to form part of the design, is the base of a structural vimana of the same age and style; the part remaining is of granite, and it probably never was finished, or if the pyramid was built of brick, as is the universal custom in the south, it probably has fallen down. This is the only instance I am aware of such an adjunct, though they may have been common in Brahmanical caves.

Opposite the front of this cave, at the distance of a few yards, the workmen have commenced to hew a temple out of an immense block that stands there; its form is scarcely distinguishable, but it is interesting as showing the mode in which the workmen set about an undertaking of this sort, which was simply to divide the rock into squares of about twelve and eighteen inches, by channels two and three inches deep, and then to split off the remaining mass, which the tendency of granite to exfoliate easily enabled them to do.

There is another pseudo-structural temple of nearly the same size and design as this one was intended to be, at the northern end of the hill, and which is nearly, though not quite, finished.

Immediately behind the present village temple, and about half way between the two caves above-mentioned, is the great bas-relief so often figured, though never so well as by Mr. Babington, in the paper above referred to. The elephants are good, and so are many of the figures, particularly the ascetic; but the whole wants unity of design and purpose, and is inferior in every respect to the Kali sculpture in the cave above, to many of those at Ellora, and to all the sculptures of Elephanta. The rock, too, has not been smoothed away between the figures, which gives the whole an appearance of not being finished, and isolates the figures and groups in a very disagreeable manner.

Adjoining is an unfinished excavation very like (in plan), to the trimurti cave near the Kylas, and a little further to the south the other large bas-relief, which, though of the same age, is of inferior execution to the great one.

The five raths are situated about a mile south of the hill in the direction of its axis, and though small, and of course unfinished, (like everything else here,) are as pleasing examples of their style as any I know. They possess an immense advantage over the pseudo-structural temples of the north; for being cut out of detached masses of granite, they stand alone in the sand, and are in every respect so like structural buildings, that it requires some examination to convince one's self they are not so. They have also the advantage in material, being cut from a fine, bold-grained granite, of a reddish tinge. It has, however, a tendency to split, which the trap of the north has not, and exfoliates when long exposed to the weather.

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[1] Plate No. 10.

Daniell's views of these temples, and the various descriptions extant, have rendered them so familiar to the public that I need not say more regarding them here; though I much wish that the elaborate architectural drawings made of them for Colonel Mackenzie could be given to the public, as they would afford juster notions of what Indian antiquities really are, than any thing that has yet been published.

I could not find in any of the temples or sculptures here the smallest trace of Buddhist worship. Every where Siva appears as the presiding deity, though with a singularly liberal allowance of Vishnuism. In the cave first mentioned so completely is this the case, that it might almost be called Vaishnava; and in the second the pendant to the Kali bas-relief is a Vishnu reposing on the Ses Seja; and in the raths the only cell that is occupied is occupied by Lakshmi, though this arises, I believe, from the unfinished state of the others; for they were certainly intended to be dedicated to Siva. It has been doubted to whom the temple on the shore is dedicated; and its sculptures, those at least on the walls, have been so corroded by the sea air, that they cannot well be made out; and though Siva and Parvati appear on two separate bas-reliefs, occupying the principal places, they may not be integral, and the large figure drawn by Babington, plate twelve, is Vishnu on the Ses Seja, extremely similar to the one in the Kali cave, while the broken Sthamba in the central apartment may or may not be a Lingam, though I myself have little doubt that it is, and that the temple was Sivite.

One of the most singular characteristics of this series of caves is that they are all of one age, and probably the work of one prince, who has carried on the works simultaneously, but from some cause or other has been unable to complete even one of them; had one been finished, or had there been any gradation of style or workmanship, some chronological arrangement might easily have been traced; but nothing of the sort exists, at least among the monoliths, and the temple on the shore does not fall strictly within my present limits, though I may mention that its age does not differ materially from that of the rest.

If the north owe its Kylas to the Chola mandalam, which I believe it certainly does, the south as certainly owes these Monoliths to the Dekkan. There is nothing here of which the prototype cannot be traced in the caves of the north. In plan and design they resemble the Hindu series at Ellora, though many of their details are only to be found at Ajunta and Salsette; and it cannot be supposed that two people, unless copying from one another, could have invented the same details in so short a period as could have elapsed between the excavating of these, and those of the northern caves; and besides, no one, I believe, will doubt, after what has been said above, that cave architecture is indigenous in the north, while these are the only specimens found in the south.

Passing by those traditions which refer to Maha Bali and the Gods, which at all events have no reference to anything now existing here, there are two which bear an appearance of great probability. The first mentioned by Mr. Goldingham, vol. v., Trans. A.S., p. 74, thus:

"A northern prince, (perhaps one of the conquerors,) about one thousand years ago, was desirous of having a great work executed, but the Hindu sculptors and masons refused to execute it on the terms he offered. Attempting force, they (in number about four thousand,) fled with their effects from his country, hither, where they resided four or five years, and in this interval executed these magnificent works. The prince at length discovering them, prevailed on them to return, which they did, leaving the works unfinished as they appear at present."

The second is from the Mackenzie MSS., as abstracted by Mr. Taylor, in the Madras Journal, No. 20, p. 65.

"In the Cali Yug, Singhama Nayadu, the Zemindar of the Vellugotivaru race, seemed to have ruled here. In that time, during a famine, many artificers resorted hither, and wrought on the mountain a great variety of works during two or three years."

Who this Singhama was appears from another MS. in the same collection, (M. J. No. 19, p. 373,) where, speaking of this race, it is said, "Vennama Nayadu became head of his race. His son was Yiradacha N., who with his cousin were successful in their incursions against neighbouring places, extending to Canchi and to the Pandya kings. The Mussulmans are also mentioned as beaten in defence of another chieftain. The son of Vennama, named Singhama Nayadu, became the head of this race."

The thousand years of the first quotation I look upon as the usual Hindu synonym for "some time ago," while the allusion to foreign conquerors seems to point to the only event I am aware of that would give probability to the tradition, namely, the invasion of Deoghur by Alla-uddín, in the end of the thirteenth century; a supposition rendered probable by the extracts from the Mackenzie manuscripts; for though no date is there given for Singhama's reign, it appears in the context that his grand-uncle or great-grand-uncle, was engaged in the revolution that placed Pratapa Rudra on the Ganapati throne, A.D. 1167, and he therefore flourished in the thirteenth century, probably towards the end of it. The allusion to the Mahomedan in this extract also renders this still more likely, as before Alla-uddín they scarcely meddled in the affairs of the south.

Though this evidence appears tolerably conclusive, I should not be inclined to rely upon it were it not corroborated by the internal evidence of the caves themselves. But altogether I fear five centuries and a half is all the antiquity we can allow to these boasted monuments of primeval times.

Singhama's death in the field, before the fort of Jalli Palli, is still more probably the cause of the sudden interruption of the works, than the reconciliation of the workmen with their northern master; it being entirely a fancy of his own, and neither indigenous in the country, nor a part of the religion of the people, it is not probable that his successor would continue the follies of his parent.

There is one other means of fixing approximately the date of these temples, to which I have not alluded, and on which I am incapable of forming an opinion; I mean the date of the characters inscribed on the large rath over the figures there. Their form, and Mr. Babington's being able to translate them, does not say much for their antiquity, though their general illegibility does, I confess, argue a higher antiquity than I have ascribed to the buildings.

Had any one done for the Alphabets of the south what Mr. Prinsep did for those of the north, the question would be easily determined, but till that is done, I fear this mode of proof is scarcely available.

In concluding this paper I would wish to add a few words on the present state of the caves, and on the means that might (and I now hope will,) be taken to preserve them from further injury before it is too late.

Those of Cuttack are, as I mentioned above, inhabited by Hindú Fakirs, but as they are not used as places of worship, or esteemed sacred by the inhabitants of the country, an order from the magistrate would, I conceive, be sufficient to dislodge them, and without interfering with any religious feelings of the people, which the Government are justly so careful of offending. If this were done very little trouble or expense would be required to remove the mud walls and rubbish they have accumulated, and thus restore to view these very interesting monuments.

Unless, however, it is intended to make and publish accurate drawings of the series, and to take some measures for their protection in future, it is scarcely to be wished that this should be done; for there is little doubt, judging from what has happened in other places, that a few pic-nic parties from Cuttack or Puri, and the destructive pilfering of a few would-be antiquarians, would do more harm in a few years, than has been done by their present occupants in centuries.

The caves of Ellora, Salsette, Junir, &c., are entirely deserted as places of worship, and therefore easily accessible to all Europeans. Their stucco and painting have however almost entirely disappeared, but their sculptures are not so easily broken, and are on too large a scale to tempt the cupidity of most collectors.

The cave at Elephanta being situated so near Bombay, was more exposed to injury than any of the others, and much was done, till Government at length appointed an invalid serjeant to look after and protect it; since that time it has been tolerably well cared for.

The great cave at Karli is now, strangely enough, taken possession of by the Brahmans, and considered a temple of Mahadeva. How far, therefore, interference with it would be practicable I do not know; access, however, is allowed to any strangers, and there are no paintings or sculptures which are likely to be injured by its present occupants, or even by English tourists.

The only series, therefore, that demands immediate attention is that of Ajunta; the caves there are entirely deserted by the natives, and are only visited by Europeans.

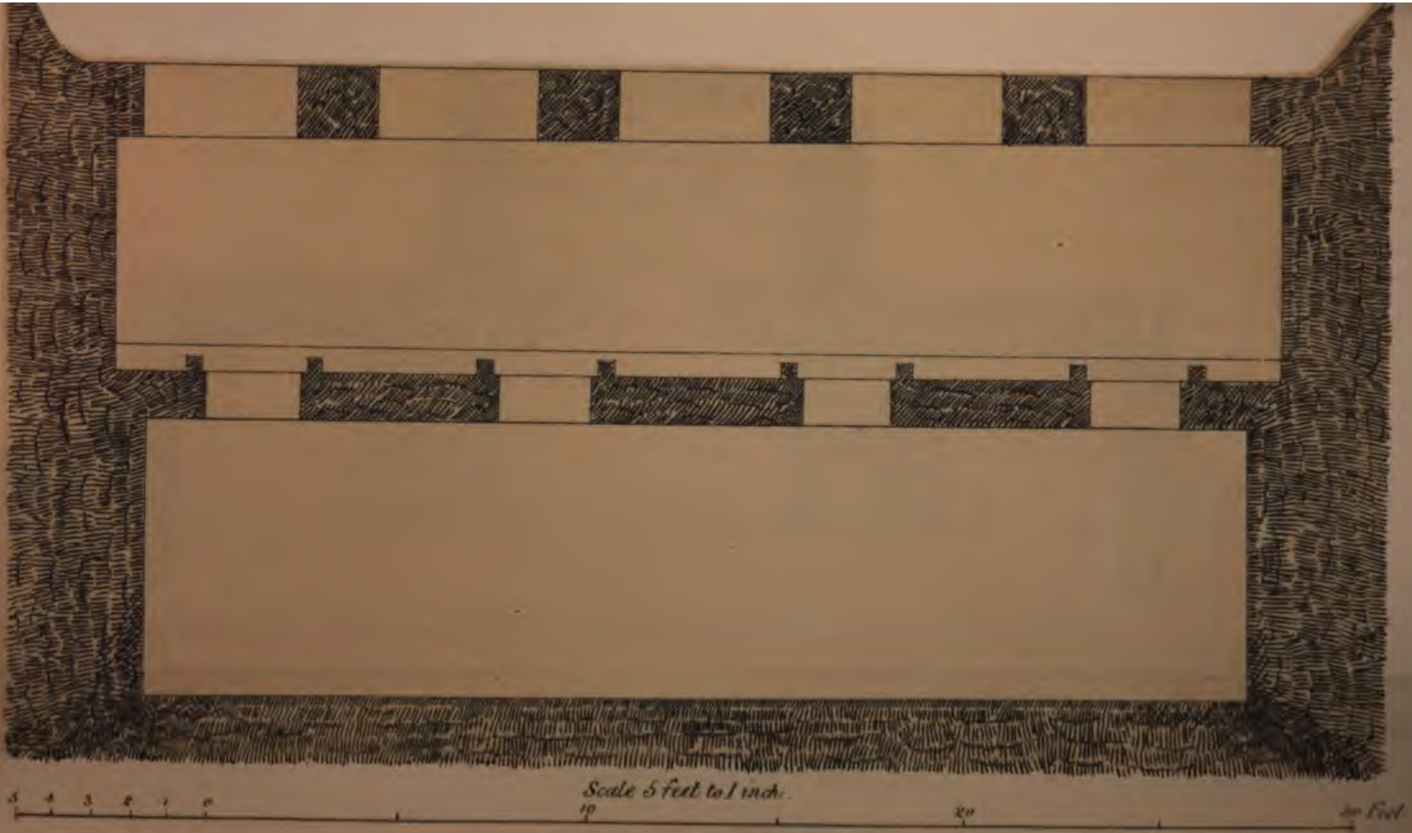
As I mentioned above they still retain the greater portion of their original paintings, but that is fast disappearing, and a traveller who would now visit them, will miss much that I saw a few years ago.

It is sad to think that after standing so many years an exposure to so destructive a climate, after escaping the bigotry of the Moslem, and the rough usage of the robber Bheel, they should be fast perishing from the meddling curiosity of the Europeans who now visit them. But such is unfortunately the case; for few come away without picking off one or two of the heads he thinks most beautiful or interesting, and as most of them are reduced to powder before they reach their destination, they are lost to the world for ever. The only instance of this I can refer to in print, is in the Journal of the Asiatic Society of Bengal, vol. v., p. 561, where it is stated, that Dr. Bird peeled four figures off the Zodiac in cave No. 17, and this is unfortunately not the only instance that has fallen under my observation.

I have now brought to a conclusion the remarks I had to make on the Cave Temples of India, which have extended to a much greater length than I supposed they would do when I originally undertook the task of compiling them. The number of objects, however, to be described is so great, that I have found it impossible to compress into shorter limits the foregoing descriptions, with the few remarks that were necessary to render the subject intelligible. Indeed, I am afraid that I am equally open to the opposite accusation of abruptness and obscurity from attempting too great conciseness; but I must be allowed to plead as an apology for this fault, as well as for the want of polish of style that pervades my descriptions, that in almost every instance, I have copied word for word in this paper the notes I made on the spot and in the caves themselves. By a little amplification and attention to style it would have been easy to have rendered the paper much more readable, but this would have added to its length, which is already too great; and besides, might, in describing objects so long after they were visited, have rendered my descriptions less correct, and thus have taken from them the only merit to which they can fairly pretend. I may also add, that when this paper was first written, it was my intention to have published at the same time, in a folio form, some eighteen or twenty of my sketches of the caves and temples described in the text, which, when taken with the illustrations now given, would, I conceive, have added much to the interest of the subject, besides supplying many of the deficiencies of the descriptions, of which no one is more fully aware that I am.

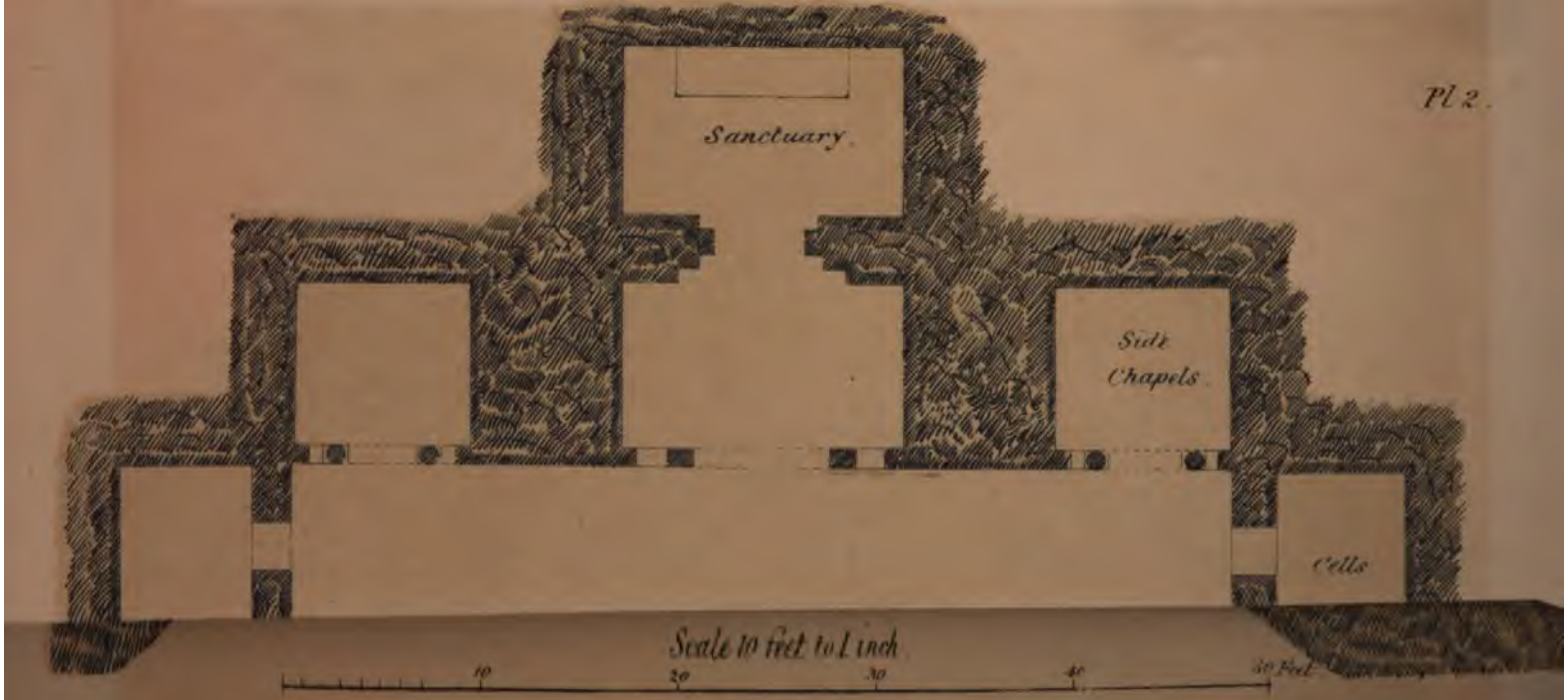
I regret, however, to say, that I have not as yet been able to find any publisher willing to undertake the publication on satisfactory terms, nor has the project met with sufficient encouragement in any quarter to which I have hitherto referred it, to induce me to undertake the risk and annoyance of bringing it out myself and on my own account; I am not, however, without hope that this may still be accomplished.

Since the foregoing paper was read, a Memorial was presented by the Council of this Society to the Court of Directors on the subject of these caves, to which I am happy to hear they have responded; and orders have, I believe, been forwarded to the different Presidencies to employ competent persons to draw and copy the antiquities and paintings in each district, and thus we may at last hope to have these caves illustrated in a manner worthy of their magnificence and great historical interest. I only hope the subject will not now be allowed to drop till every monument of ancient India has been thoroughly examined and detailed, and we may thus escape the hitherto too well merited reproach of having so long possessed that noble country, and done so little to illustrate its history or antiquities.



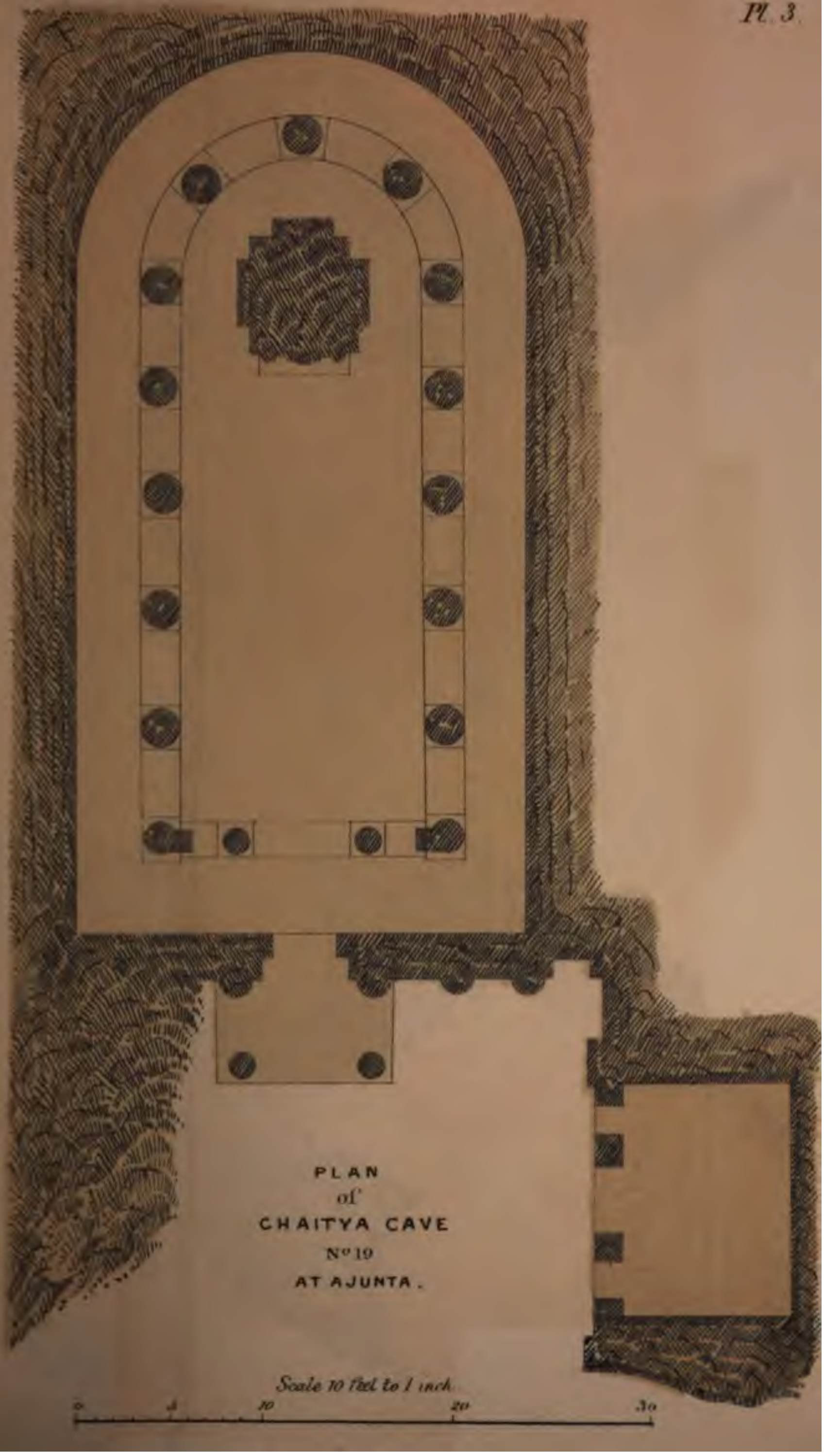
GANESA GUMPHA OR GURBHA UDYAGIRI

Pl 2.



PLAN OF VIHARA CAVE Nº 2 AT AJUNTA

Pl. 3.



PLAN
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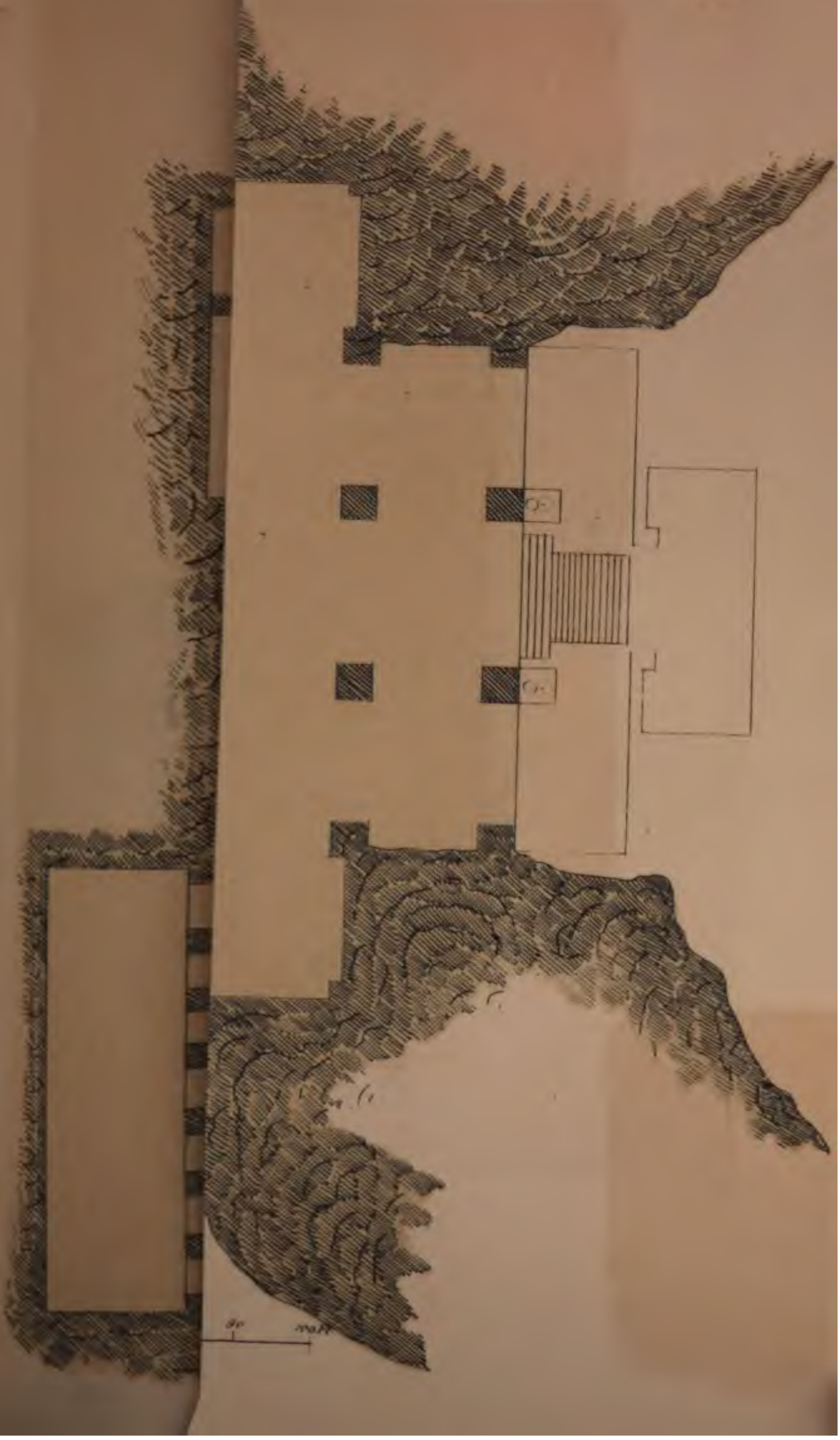
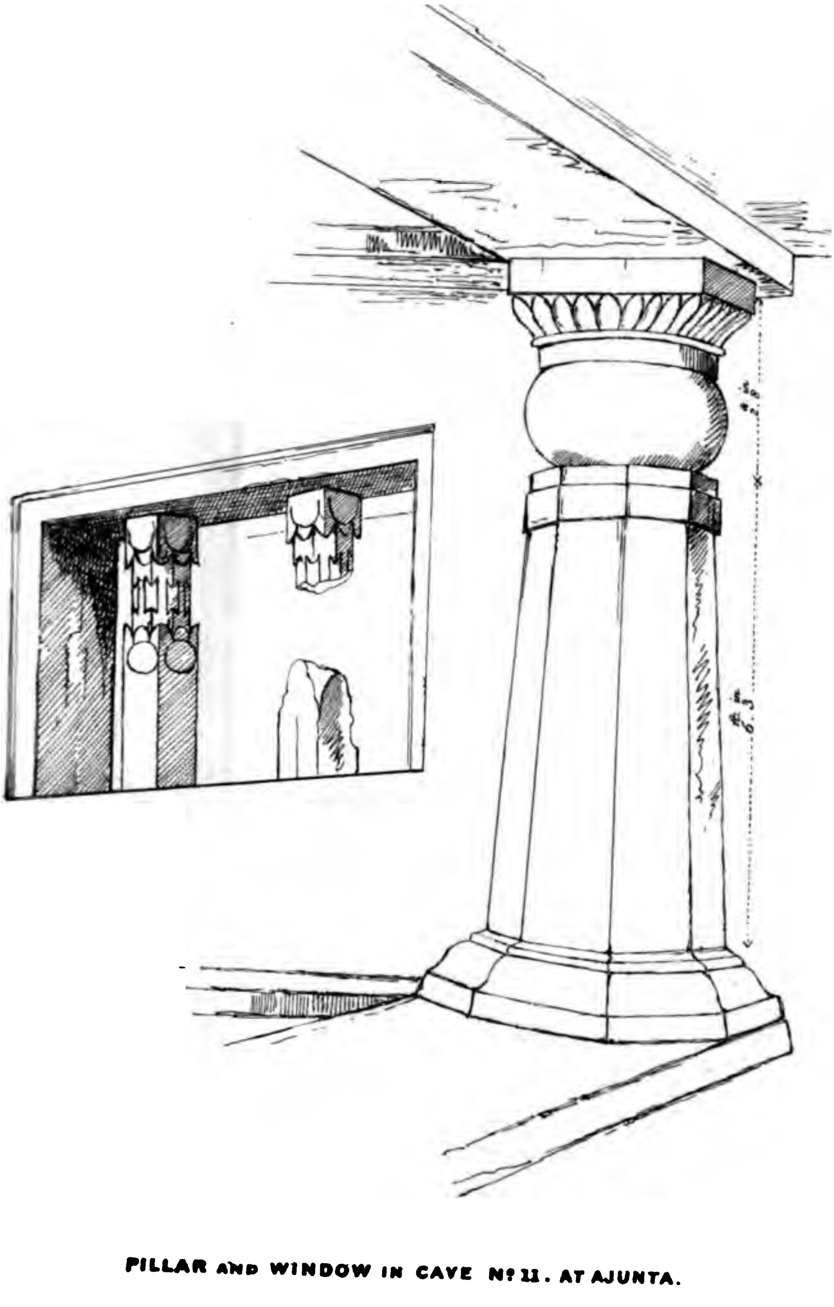
CHAITYA CAVE
No 19
AT AJUNTA.

Pl. 4.

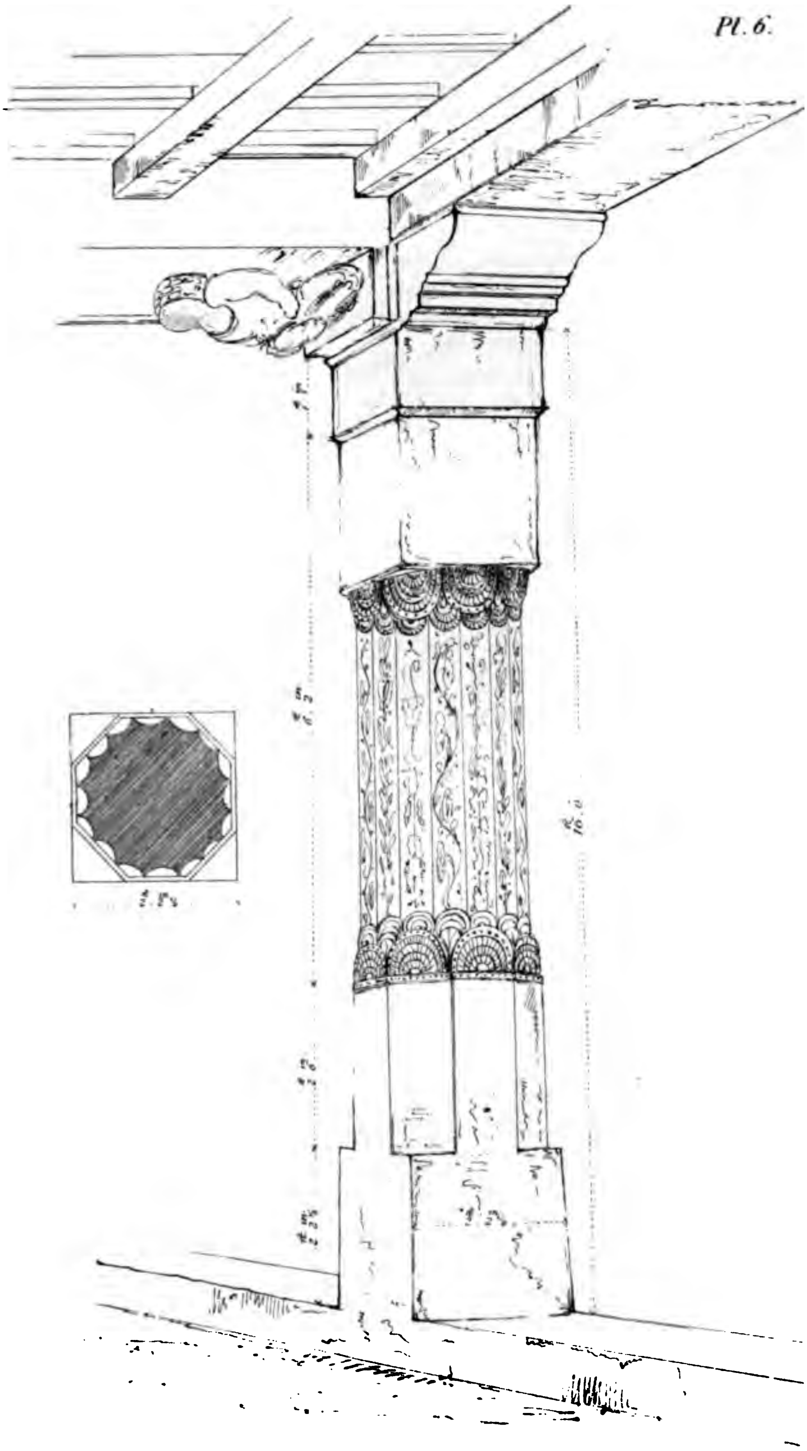


Pl. 5.

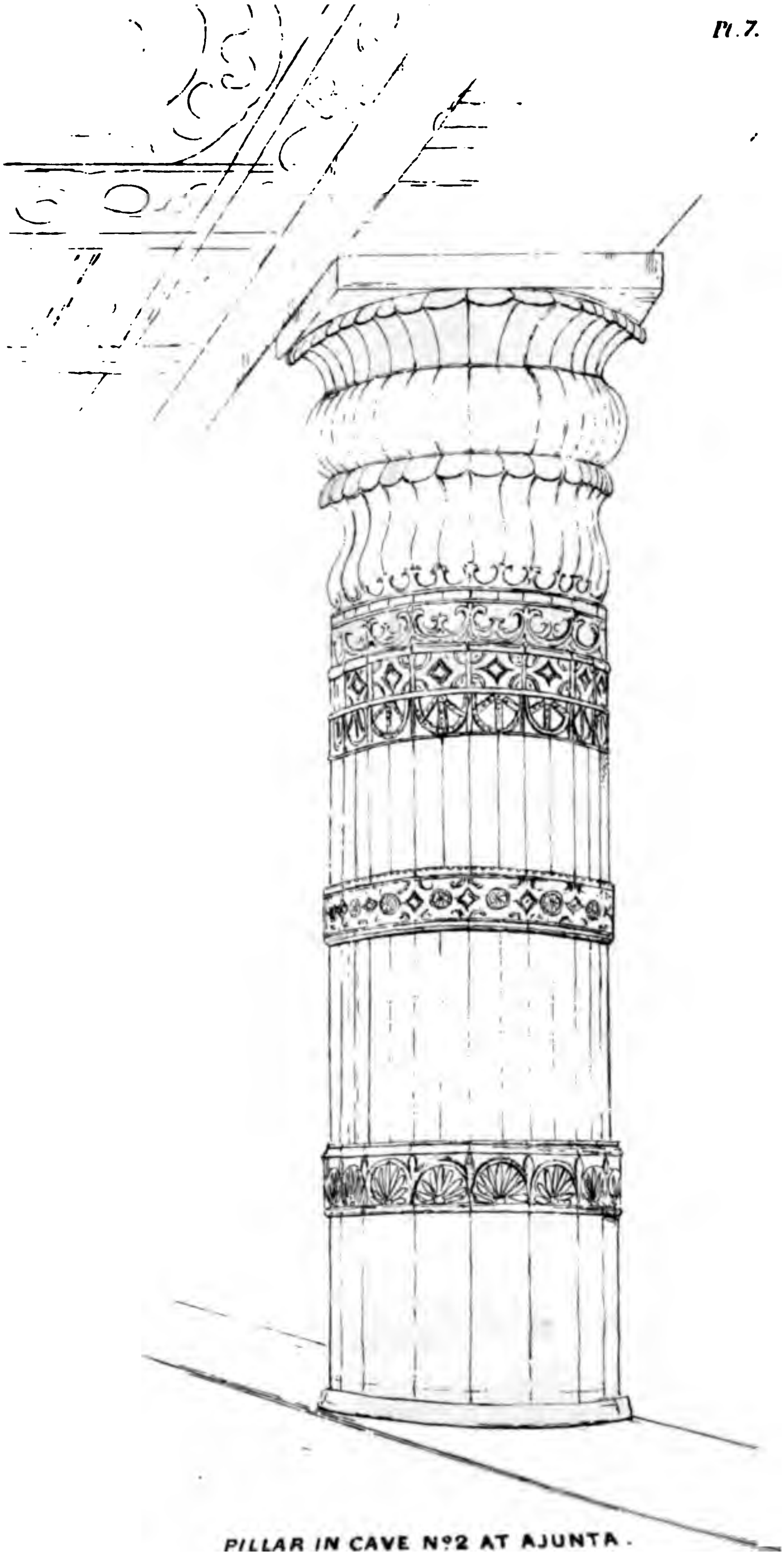


PILLAR AND WINDOW IN CAVE Nº 11. AT AJUNTA.

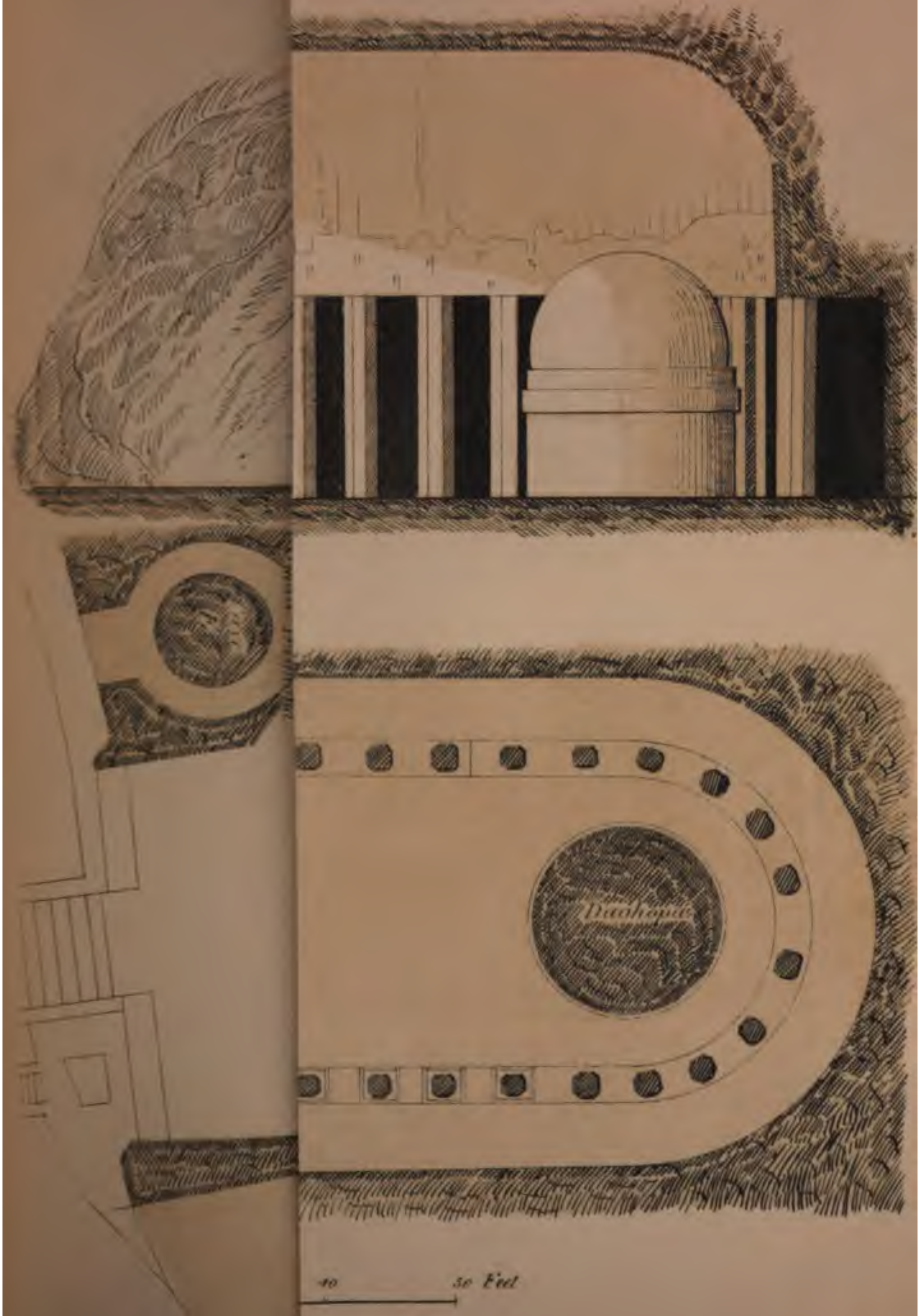
Pl. 6.



PILLAR IN CAVE Nº 17. AT AJUNTA.



PILLAR IN CAVE No. 2 AT AJUNTA.



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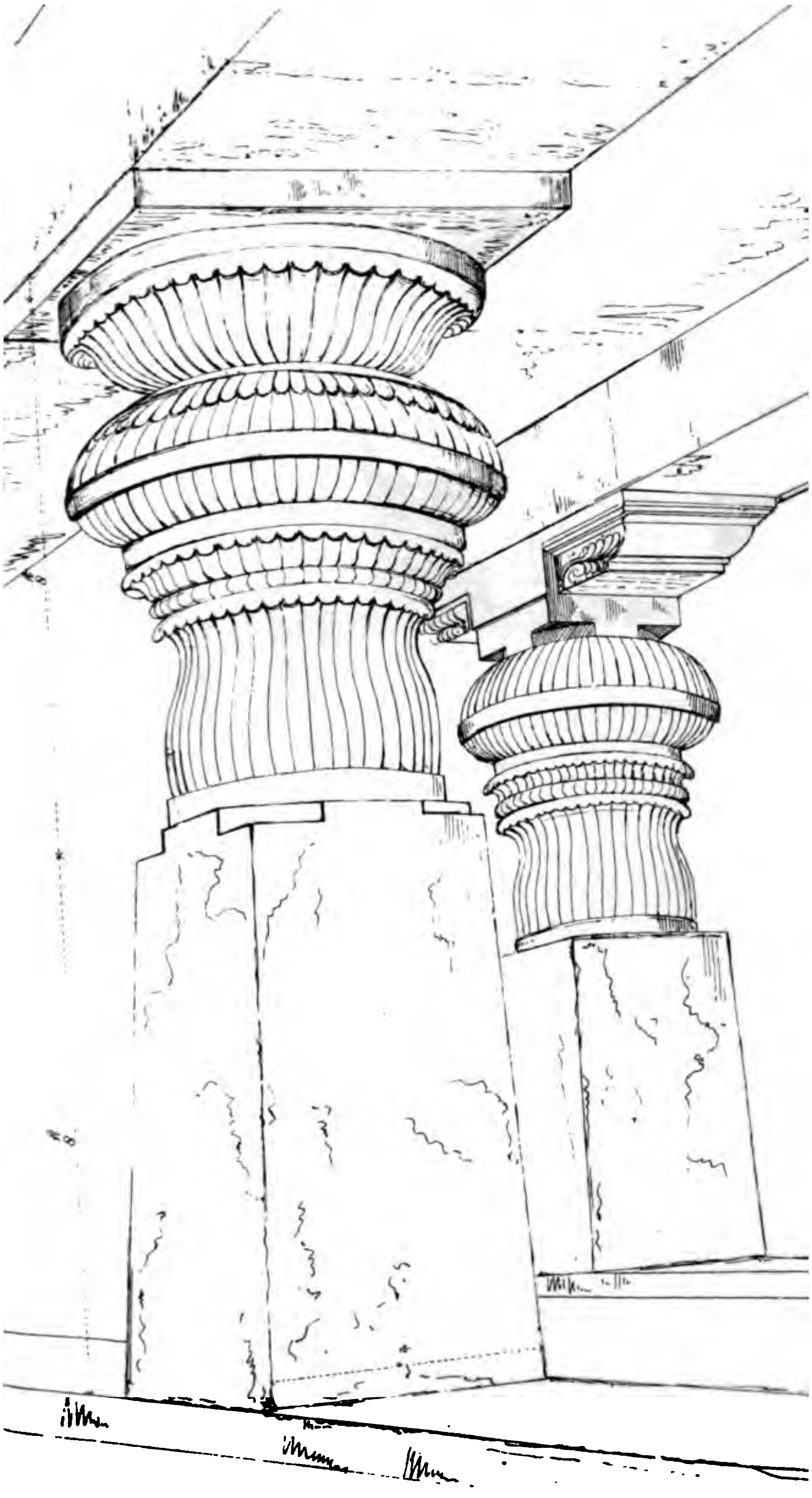
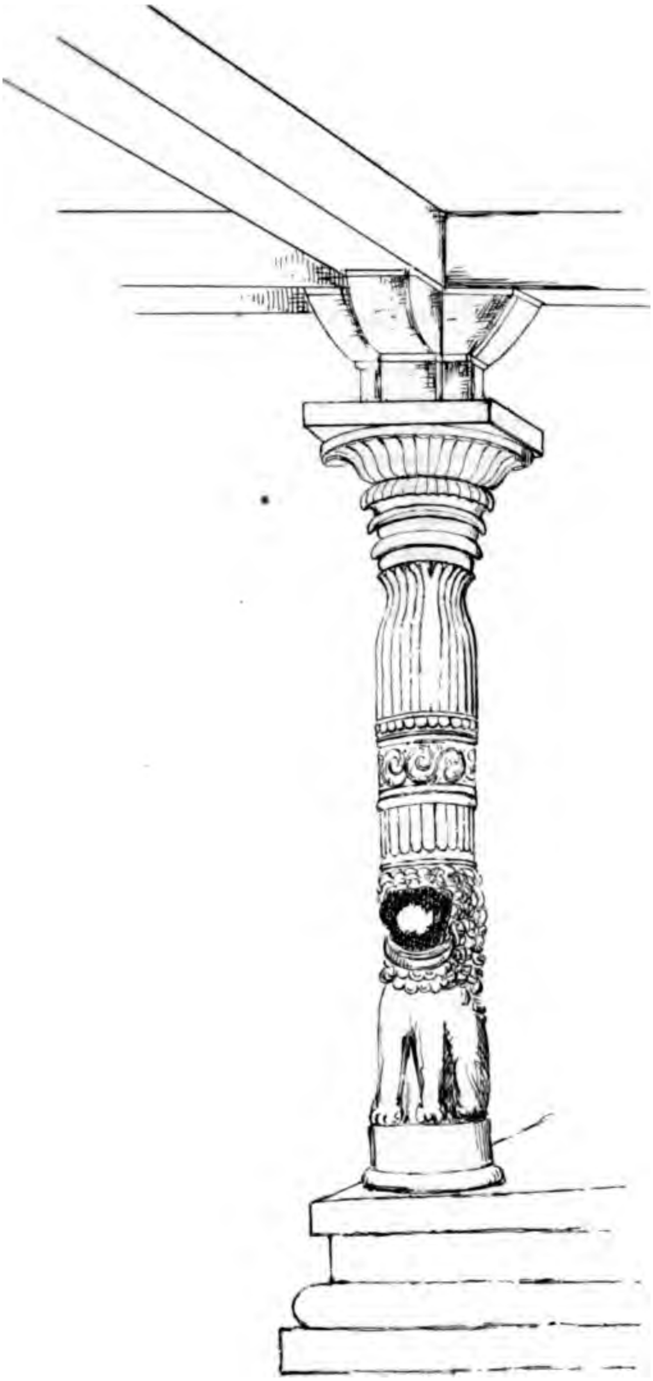


Pl. 10.



PILLAR IN CAVE AT MAHAVELLIPORE.

ART. III.—*Notes on Indian Agriculture, as practised in the Western or Bombay Provinces of India; by* ALEXANDER GIBSON, ESQ., *Superintendent of the Botanic Garden at Daporee.*

Read 15*th June*, 1844.

I DO not offer these notes for perusal in the idea that they communicate any thing very new, neither do I suppose that from their contents can be elicited any thing likely to be of solid benefit to the more enlightened agriculturist of Great Britain; as little do I fancy that they can possess even a tithe of the interest which must attach to a detailed description of the careful cultivation practised by the industrious Chinese husbandman. Still, I deem it possible, that they may in some points not be destitute of interest:

1st. As showing that the agriculture of India is not altogether of so rude or slovenly a character as it is often supposed to be.

2nd. That many of the means and instruments used, albeit simple, are yet well adapted to attain the end in view.

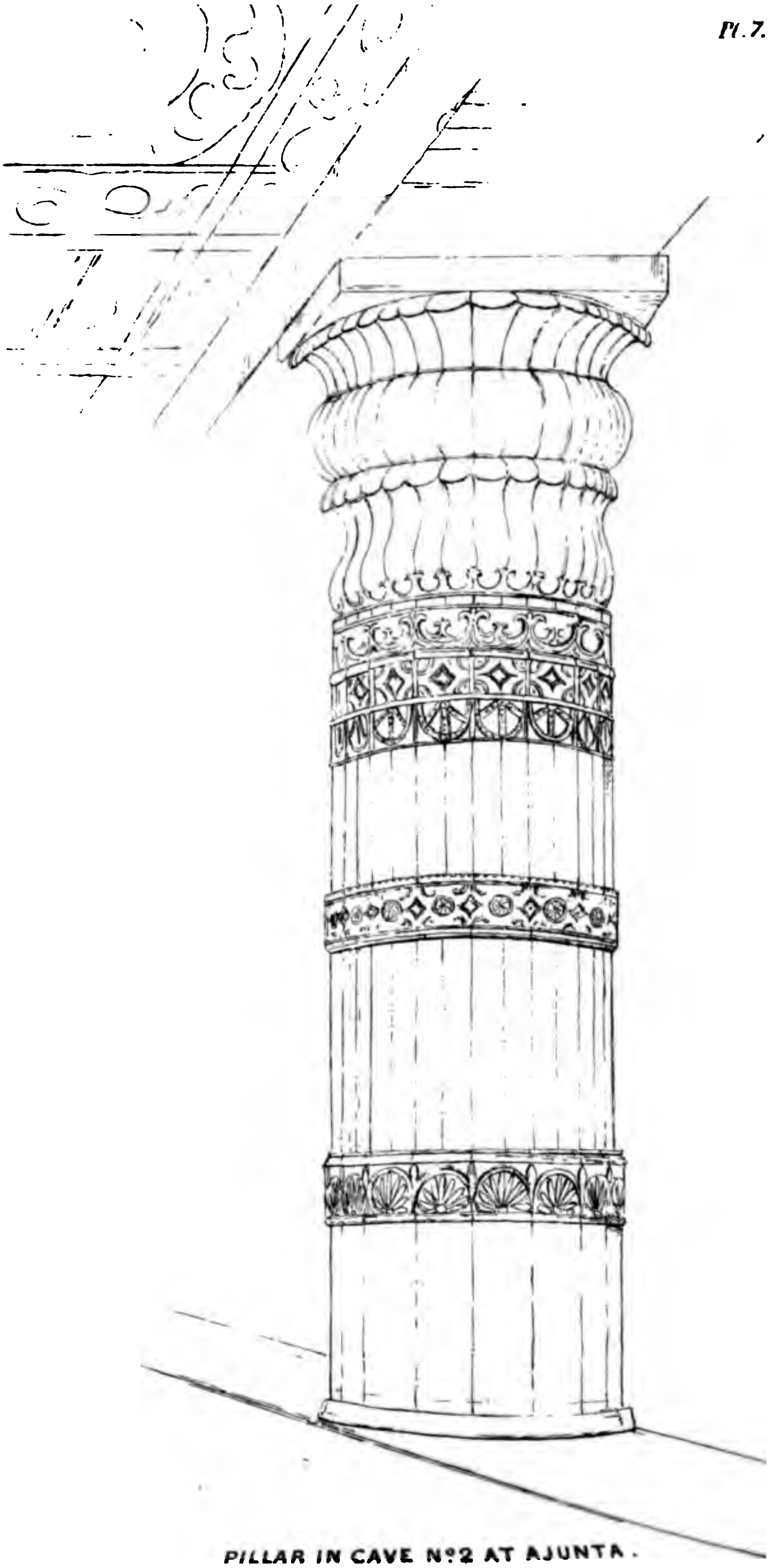
3rd. That much of what is bad in the husbandry of India, is owing rather to the faulty framework of the social system of the Hindús, than to any natural want of acuteness.

4th. That until the habits of the people as regards their social system, be in some measure changed, little or no alteration in the present routine of practice is to be looked for.

The remarks which have led me to form the above general conclusions, will be found scattered among the details given hereafter. Having premised thus much, I will proceed to notice separately the modes of cultivation of the various Cereal Grains, Legumes, Oil-Plants, &c., in common use.

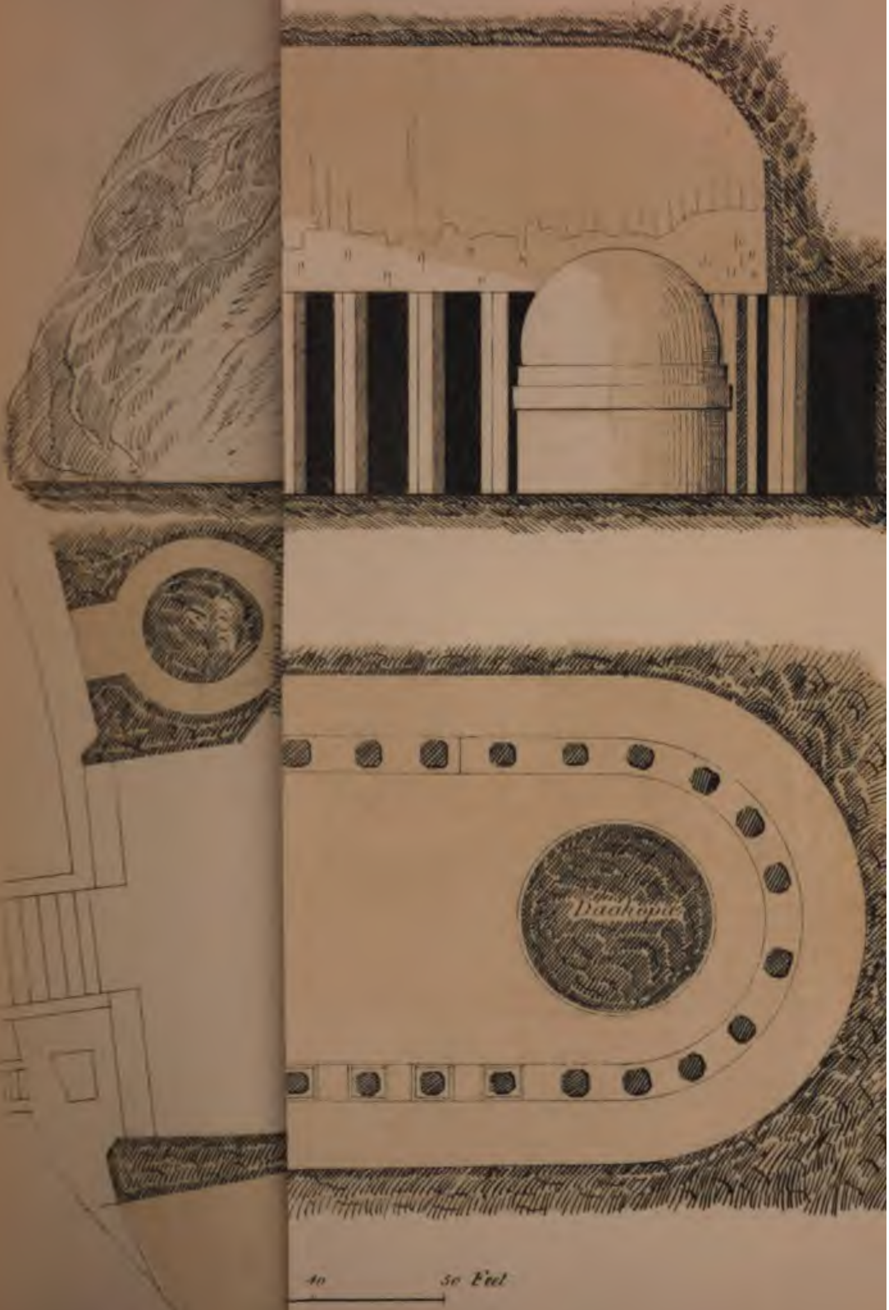
1st, WHEAT.—Is grown chiefly above the Gháts in the Dekkan, Kandesh, and the Carnatic; also most extensively in Gujarat, even to the sea border. Farther south, the climate and soil under the Gháts, do not admit of its being grown. It is also extensively raised in many level table-lands met with before the Gháts soften down to the flatter plains, and on such high levels the same measure of grain is found to weigh about one-quarter more than a similar quantity raised in the more plain country.

Wheat is universally sown as a crop of the cold season. The land intended for it, however, receives its first preparation either in



PILLAR IN CAVE No. 2 AT AJUNTA.

Pl. 8



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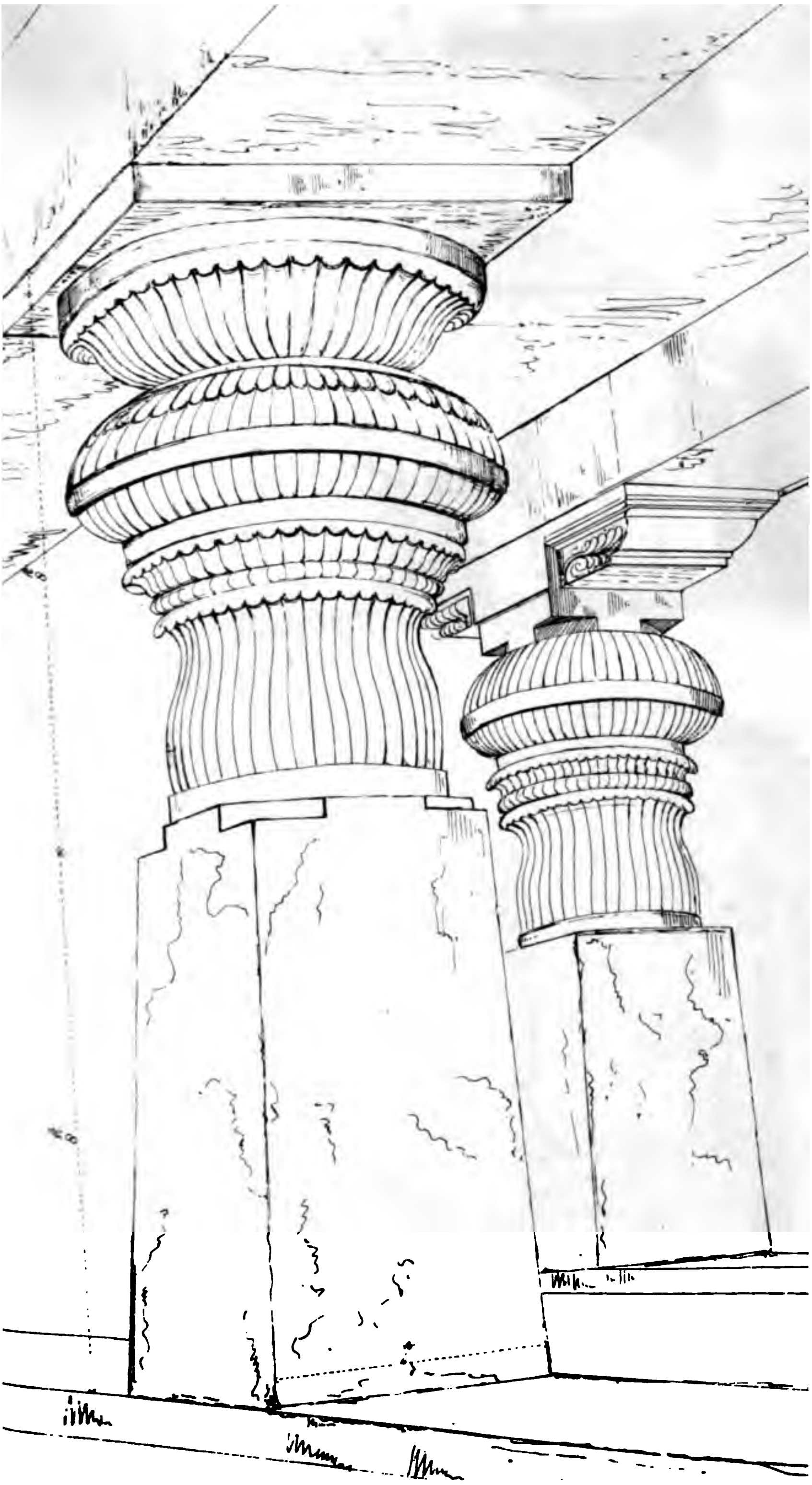

For the transport of an article so bulky as cotton, large numbers of bullocks are required; the Jowari straw can be afforded at a rate so cheap, as to be accessible to the poorest; the price varies according to situation, season, &c., from four to fifteen rupees per thousand bundles, and the size of these may be judged of by the fact that ten of them form a load for a man. The straw, particularly of the second variety, is very nutritive; it is carefully stored up as a resource in case of a bad season. In Gujarat it is stored in houses; in the Dekkan and Carnatic, I remark that it is preserved simply by overlaying the sloping stacks with clods of the black soil; these are beaten down by the rain into a uniform mass, which forms a hard crust over the stack. This straw is the principal food for elephants and camels in countries where trees and shrubs are scarce.

This cereal is often sown solely for the sake of the straw; this is done in districts where other pasturage is scarce, but where the means of irrigation are abundant; when sown for this purpose, sowing takes place in March, in ground well manured; it is sown very thick, as length of straw and not weight of ear is the object. It ought to be fit to begin cutting by May 15th, and a careful husbandman calculates on having a supply sufficient for his bullocks until the first rank grass of the rains gathers some heart and is fit for food; it is cut green, and the quantity required for daily consumption is cut, and the remainder left standing. In seasons when from deficiency of the early rain forage is scarce, this straw can often be sold standing, at the rate of about fifty rupees per acre.

In a poor country, such as that which forms a large portion of our Dekkan province, where there is almost always an under supply of forage, every fair means should be taken to encourage the extension of a cultivation so essential for the preservation of animals as this. It is therefore with sorrow, I remark, that under the new survey now in progress, a tax on wells, even of the most common description, is being re-imposed. Since the total abolition of well tax in the Poonah zilla which took place about seventeen years ago, the ryots have exerted themselves in vastly multiplying the means of irrigation. We may now look for a complete check to this spirit, and it seems too probable, that even many wells now in use will be thrown up.

The selling price of millet may be quoted as varying from one hundred and forty to one hundred and seventy pounds per rupee. It seems to form the principal food of the inhabitants of large cities, artisans, weavers, and others whose employments are sedentary. A quantity sufficient for two meals may be purchased for about a halfpenny.

The roots of the crop of a previous season are thrown into embankments to help in binding together the soil. Every good cultivator constructs such embankments when the soil of his field is at all sloping, and consequently liable to be washed away. Sometimes they are done by the labour of his own household, but more generally under contract with wirdars, a class who travel about the country performing work of this kind.

ELEUSINE CORACANA (*Natcheny, nágali, maud*).—Cultivated principally as a hill grain, but also in the plains. *E. stricta* is the species cultivated in the latter; it is not an article of general culture, but only in garden villages, near and below the Ghâts, where soil is alluvial, and stream water abundant.

The young plants are raised in a bed formed by ash manure; on the ground being thoroughly moistened, which it ought to be by the 10th July, the young plants are taken out and puddled down in the adjacent fields previously prepared by a light plough and harrow. The increase of this grain is very great, in good soil about three thousand pounds per acre; it is a cheap grain; its price may be quoted at from one hundred and fifty to one hundred and ninety pounds per rupee. I believe that the Banyans often refuse it as a return for cash borrowed, a proof of the small value attached to it in proportion to its bulk.

The hill species, *E. coracana*, is a smaller plant and much less productive; it is planted out in July. As the mode of its cultivation is identical with that pursued with the other hill grains (one excepted,) one description may serve for all.

A piece of jungle is cleared of bushes or trees in any of the dry months; the bushes, leaves, and wood, are thickly spread so as to cover the ground intended for the plants; fire is applied in April or May; with the first rainfall seed is sown broadcast. When the plants are sufficiently high, advantage is taken of wet weather to scratch the adjoining ground into furrows, either by hand or a light plough, a person follows in the furrows with a basket of the plants, which are simply dropped in, and left to be brought on by the rain acting on the loose soil. No farther care is required, and reaping takes place in October or November.

On account of the broken nature of the ground it is impossible to estimate accurately the quantity of grain obtained from a given portion of soil, but it is certainly less by three-quarters than that obtained from the garden species above alluded to.

Land thus treated is cultivated for four years in the following rotation.

1st. *Eleusine Cor.*, Natcheny.
2nd. Wari, or Kang, (Kangni?) *Panicum Miliare*, and *P. Italicum.*
3rd. Harík, Kodroo, (Kadrava,) *Paspalum scrobiculatum.*
4th. Verbesina, Black Til, an oil plant.

These four crops are considered to exhaust the soil, which is left in fallow for twelve years. The straw of Natcheny is indispensable to the Ghát peasant and the Concan cultivator, as a food for their cattle. In those countries the grass, either from the nature of the climate, or the late period at which it is cut, contains little or no nutriment, and cattle fed on it could not labour for any time. The sale of the spare straw is one of the resources of the peasant, and it is largely purchased by the Lingayet and other travelling grain dealers, whose cattle are generally in good condition. The Banjaras again, or Lumans, make no provision of the kind for their cattle, and the consequence is, that of those who come down for salt late in the season immense numbers die.

The straw of the *E. natcheny* is also used for burning bricks when it is intended that these should be large, or of choice quality; it is chopped up and mixed with the brick clay; the effect, of course, is the thorough baking of the brick. The large bricks to be met with in all old buildings of the Mussulman princes of India have been prepared in this way, so that the children of Israel had reason for grumbling in that they were compelled by Pharaoh to make bricks without straw. (*Vide* Exod. c. v.).

As the roots are many, the grain is thrown on embankments in order that the plant, as it grows, may bind together the earth and stones.

OTHER HILL CEREALIA.—Of these, it may be said generally, that the mode of cultivation is as in that last described; that the produce is quite as cheap or cheaper, and is seldom used as food beyond the districts where it is produced. The patch of rice is chiefly looked to as a mean of paying the land-tax, and the cultivator is fortunate if he has a sufficiency of the other grains to last until the following October.

I remark, that this season locusts appear to have alighted only in villages close to the Gháts, or in the Gháts, and in many of these the crops have been so completely eaten up, that the villagers have already begun to feed on the stems of the wild plantain-tree, the wild yam, and the more delicate but rarer root of an undescribed umbelliferous plant named "Peenda."

Before concluding, I will advert to the remarkable intoxicating property found in one of these grains, Harík, a *Paspalum* (frumentaceum?) I have had occasion to see a large number of inhabitants of a village simultaneously affected with intoxication, after a meal made from cakes of this flour. Vertigo, a degree of sleepiness and fatuity, rather than active excitement, is the characteristic effect of this grain. The symptoms are sometimes of a character more severe, lasting for seven days and attended with a vomiting of blood; fatal cases it is said sometimes happen, but I have not any case well authenticated; the effect from the grain eaten is not constant. It is most apt to occur when the grain has attained full development owing to late and heavy rain, acting on a highly manured soil.

Its intoxicating property is said to be neutralised by previous steeping in water wherein cow dung has been diffused.

The remedies had recourse to after the effects have taken place are,

1st, A pottage composed of the flour of "Borud," (*Phaseolus mungo*); and 2nd, expressed juice of leaves of "Harsinga," (*Nyctanthes arbor tristis*).

The action of this grain on the human system is well worthy further investigation.

ART. IV.—*A Letter to* RICHARD CLARKE, ESQ., *Honorary Secretary to the Royal Asiatic Society, on the Oriental MSS. in the Library of Eton College.*

[*Read* 16*th March*, 1844.]

MY DEAR SIR,

AT the close of last season you did me the favour to communicate to me a letter from a member of this Society, Major Postans, alluding to the Oriental MSS. in the Library of Eton College. That collection had occupied my attention some time before, having during the last three or four years, on occasional visits to the College, examined the MSS. very minutely, for the purpose of making their existence better known than it appears to be. With the exception of the late lamented Sir W. Ouseley, and Professor Lee of Cambridge, they seem to have entirely escaped the inspection of Orientalists.

The history of the collection is curious and interesting. Above fifty years ago, Mr. E. Pote, a Scholar on the Foundation of Eton College, having subsequently completed his studies at the sister institution, King's College, Cambridge, and entered on public life in India, collected in that country between four and five hundred MSS., chiefly Persian and Arabic, as the most appropriate offering he could make to the two royal foundations to which he was grateful for his earlier education and preferment. The gift was announced by a letter from Mr. Pote, from Patna, Feb. 1788, explaining its object, and arrived in England in 1790, when, in compliance with the donor's wishes, the books were divided between the Colleges of Eton and King's, and deposited in their respective libraries. A catalogue, prepared in India, was to have accompanied the collection, but was not received till four years after. It will readily be conceived by those conversant with Eastern bibliography that the description it contains would be far from satisfactory in the present more advanced stage of science. The kind friends to whom I am indebted for the greatest indulgence in visiting the College Library, have promised me a copy of this catalogue, from which, with the numerous notes I have taken of the MSS. themselves, I hope to be able to arrange a list, if not entirely satisfactory, at least more available for reference and research. In the mean time, the following hasty sketch of its contents may perhaps be worthy the notice of lovers of that literature.

The portion of the Pote Collection appropriated to Eton College contains 222 volumes. The department of history in which it is most rich, relates chiefly to the country in which the collection was formed.

It comprehends the valuable history the Bóstáni Khayál; a Táríkh Kashmíri by Haider Ibn Hasan Mulk; the Ayíni Akbari; the Táríkh Shah Shujái, or History of the Four Sons of Shah Jehan; and the Histories of Baber, Akber, Jehangir, 'Alamgír, Ferruksír, and Muhammed Shah, which bear their names. Merely in reference to our recent success in India I may mention also a copy of the Gwalior Nameh, an account of the capture of that fortress in 1780.

In General History there are the Majmua al Tawarikh; the Labb al Tawarikh; the Mukhtasar al Tawarikh, by 'Abdasselám; the Tarikh Bedawani; the Compendium called Muntakhab al Tawarikh; and a History called Kutub al Tawarikh, terminating with the reign of Shah Tahmasp; while the Aalam Arái, Tarikh Nádiri, and Zafar Nameh (a valuable copy made at Herat, 877), illustrate the reigns and conquests of Timur, Shah Abbas, and Nadir Shah. I must particularly notice a beautiful copy of the Matla as'saadín, in 2 vols., (written 993), the Tarikh Elfi, or Chronicle of the first 1000 years of the Hijrah, and another History of Abbas the Great, styled the Abbas Nameh, which I do not remember to have seen elsewhere. To the historical series may be appended a few works on Biography, Geography, and Historical Geography; as, the valuable Heft Aklím, the Nigaristan of Ghaffári, and the MS. of the Mesálik u Memalík used by Sir W. Ouseley in his edition of Ibn Haukal. In Lexicography there is the Kámús, one of the most exquisite copies I have ever seen; the Sahháh, a magnificently written large folio, pointed throughout; the Dictionaries, Kashf al Loghát, (from the library of Sultan Ahmed ben Masoul); the Kunz al Loghát, Maadan al Loghát, Lutayif al Loghát, and Gheráyib al Loghát; the Ferhengi Rashidi, and a Ferhengi Akhláki Násiri specially devoted to the difficulties of that ethical work. Nor is the collection deficient in Theology, Ecclesiastical History, Jurisprudence, and Tradition, which form so large a proportion of the contents of most Muhammedan libraries. Accordingly, we have several Korans, with numerous Commentaries, including that of Baidháwi; the curious work Fusús al Hukama; a beautiful MS. of the Mirát al Kadas, or Tarikh Hezrati Isa; the Majmua al Bahrein by Dara Shikoh; the Rawzat al Ahbáb, a noble folio in beautiful Naskhi; fine old copies of the Maárij la Nebúwwat, of the Mishkáti Sherif and the Sharhi Mishkát, with the voluminous compilations of Decisions collected under the titles of Awrádi Imamíyah, Fatawái Alamgiri, and Fatawái Firozsháhi. Among the philosophical and scientific works, besides several medical books, there is the valuable Encyclopedia, Nefáyis al Funún; and there is a Persian Commentary on the 'Milal wa'l Nahal' of Shahrestáni, now edited by the Text Society.—The Poetical works are not numerous.

There is, however, a splendid Shah Nameh (in 2 vols.), formerly belonging to Col. Polier, of which there is another copy, apparently not of the Pote collection; and there are duplicates of the well-known paraphrase Shamshír Khâni, besides a Mesnawi Mânawi of great beauty and value. Also the Makhzan al Asrar of Nizami; Jami's Yusuf and Zulaikha, Hatifi's Laili and Mejnun, and a poem of Mahmud u Ayáz; the Mystical poems of the Mantak al Tayr, and the Gulshani Ráz; the Karán as'saadein of Amir Khusru of Dehli, and his Khamsah; and the entire works of Shaikh Alí Hazín. The few Hindustani MSS. the collection contains are chiefly in this class, comprising the 'Story of Madhu Null;' Kamrup, (of which there is also the Persian version;) and Sawda's Kulliát,—a very beautiful copy. There is also the Persian Nal u Damna, and a full set of a Persian translation of the Mahabharata.

Some of the MSS. of small Persian poems are of beautiful penmanship and ornament, but the gem of the collection is an exquisite little Ajáyib al Makhlúkát, in verse, of which the original work in Arabic, and the usual Persian version of Kazwini should have been mentioned before, and are all three embellished with miniature paintings. A Sanskrit work, highly ornamented, forms also one of the show pieces of the Library; I believe it is the Siva Purána.

The usual lighter works of Arabic and Persian literature have also a place here; the Gulistan and Bostan, beautifully written; Hatim Tái; Lutayif al Zaráyif (stories); Túti Namah; the Makámát ul Hariri, with a commentary; and the usual sprinkling of Risalahs on Music, Grammar, Cookery, and Farriery, which is incidental to a miscellanous collection. I may conclude in the words of that accomplished Persian scholar, Major Charles Stewart, who in the postscript to his 'Descriptive Catalogue of Tippoo Sultan's Library,' says:—

"Were the Oriental Manuscripts, dispersed through England, either generally known, or assembled in one place, Britons need not travel far to prosecute their Oriental studies."

Believe me to be,
My dear Sir,
Very faithfully yours,
N. Bland.

Randall's Park, March, 1844.

Art. V.—*Abstract of a Discourse, by* Dr. Falconer, *on the Fossil Fauna of the Sewalik Hills.*

Two evening meetings of the Royal Asiatic Society were held at the Society's Rooms, in Grafton-Street, on the 1st and 8th of June, when Dr. Hugh Falconer gave a discourse, in two lectures, on the ancient animal races of India, as indicated by the Fossil Fauna of the Sewalik hills. The first meeting was occupied with a general description of the Sewalik fossil animals. Dr. Falconer referred to the antiquity of the human race in India, and the spreading of its mythology, arts, and sciences, over other nations: they had extended to Greece and Italy through Egypt. There is a limit to antiquarian research, at the point where we cease to have indications of the human race. If we desire to dive further into antiquity, we have to fall back on the monuments and inscriptions constructed by nature, on the fossil remains of the extinct races of animals which formerly peopled the earth. Some of the Sewalik fossils appear to afford grounds for entertaining the presumption that it may be possible to connect the human epoch with very remote times. The *Colossochelys Atlas*, or gigantic fossil tortoise of India, discovered by Captain Cautley and Dr. Falconer, supplies a fit representative of the tortoise which sustained the elephant and the infant world in the fables of the Pythagorean and Hindu cosmogonies. It is a point of great interest to trace back to a probable source, a matter of belief like this, so widely connected with the speculations of an early period of the human race. Dr. Falconer gave a brief historical account of the discovery of fossil remains of extinct mammalia in India, commencing with the incident mentioned in Ferishta's history, during the reign of Feroz Toghlukí, A. D. 1360; the discoveries of Captain Webb and Mr. Henry Colebrooke, in the elevated plain of Tibet; the Irrawaddi remains met with by Mr. Crawford, and described by Mr. Clift; the Sewalik fossils discovered by Captain Cautley and Dr. Falconer, Captains Baker and Durand, and Colonel Colvin; the Nerbudda fossils, by Dr. Spilsbury; the Gulf of Cambay fossils, by Dr. Lush and Lieutenant Fitzjames; and the Jumna fossils, by Serjeant Dean. Dr. Falconer then briefly described and exhibited specimens of the most remarkable fossil species. There were no less than five extinct species of mastodon and elephant; viz.: the *Mastodon latidens*, (Clift); *M. Elephantoides*, (Clift); *M. Sivalensis*, (Falc. and Caut.); *Elephas quadrifrons*, (F. and C.); and *E. Hysudrensis*, (C. and

F.): the Sewalik fossils showing that these so-called genera are undistinguishable through any characters derived from the form and structure of the teeth. Then followed the fossil species of Rhinoceros, the Hexaprotodon hippopotami, Merycopotamus, (Caut. and Falc.) a remarkable new genus; Anoplotherium Sivalense; several species of Sus, and three species of the genus Equus. There were nearly as many fossil species of mastodon and elephant, as there are now species of the whole order of Pachydermata upon the continent of India. The fossil Ruminants were then described. They were surprisingly rich, including almost every type, fossil or recent, known in the order; viz., two species of Giraffe, *Camelopardalis Sivalensis*, (Falc. and Caut.), and *C. affinis*, (C. and F.); species of Camel, Deer, Antelope, Musk, *Bos*, *Bubalus*, *Bison*, in a great variety of forms, and the colossal ruminant, *Sivatherium giganteum*, (C. and F.), bearing four horns, and nearly approaching the elephant in size. The Sivatherium was illustrated with a full-sized restored diagram of the head.

The Carnivora were described as comprehending fossil species of Felis, Hyena, Canis, Mustelidæ, Machairodus, and the new forms of Hyænarctos, and Enhydriodon (F. and C.) There were several fossil species of Quadrumana, and forms of Rodentia and Insectivora. The Sewalik Reptilia were exceedingly rich in forms, particularly of the Crocodiles and Chelonians, some of which were undistinguishable from existing species; while the *Colossochelys Atlas* tortoise is a prodigy of size in the order. It was in every part of its organization a true land tortoise; estimated from numerous remains, to have had a shell twelve feet long, and six feet high. This colossal reptile has lately been described in a communication to the Zoological Society; and was illustrated by an excellent restored diagram of the inferred natural size, by Mr. Scharf, eighteen feet long. Dr. Falconer speculated on the possible connexion of this fossil form with the gigantic tortoise which figures so prominently in the Pythagorean and Hindu cosmogonies.

In his second lecture, on the 8th instant, Dr. Falconer gave the general conclusions drawn from the Sewalik Fossil Fauna, and its bearings on the climate, geography, and geological changes of ancient India. The first prominent character was the wonderful variety of forms. It seemed as if all the geographical divisions of the old continent, and every geological epoch from the older tertiaries down to the modern, had contributed representatives to form one comprehensive fauna in ancient India. Monkeys, Camels, Giraffes, &c., were mixed up with Anoplotherium, Sivatherium, &c. All the mammiferous remains which had been gone fully into, belonged to extinct species; while some, in regard to which the evidence was incomplete, came very near to existing species, and might ultimately prove to be identical with them. Some of the reptilian forms appeared to be identical with existing forms. The Sewalik Fauna was remarkable for a general peculiarity of type, and for the number of transitionary forms contained in it. Half of it exhibits a parallel representation of the existing Fauna of India, and the remainder represented the forms met with in the older tertiaries. It contained, so far as the inquiries had yet gone, no species of the Marsupial, Edentate, or Cetaceous orders. The abundance of the remains in the Sewalik strata was indicated by the immense extent of the collections. That which Captain Cautley had munificently presented to the British Museum, amounted to about two hundred chests, averaging about four hundredweight of contents each, while other collections, nearly equal in extent, were formed by Captains Baker and Durand, Dr. Falconer, Colonel Colvin, and others.

Dr. Falconer then gave the geological and climatal bearings of the question. The continent of India, at an early period of the tertiary epoch, appears to have been a large island, situated in a bight formed by the Himalayas and Hindoo Koosh ranges. The valleys of the Ganges and Indus formed a long estuary straight into which the drainage of the Himalayas poured its silt and alluvium. An upheavement took place, which converted these straits into the plains of India, connecting them with the ancient island, and forming the existing continent. The Sewalik Fauna then spread over the continent, from the Irrawaddi to the mouths of the Indus, two thousand miles; and, northwest, to the Jhelum, fifteen hundred miles. After a long interval of repose, another great upheavement followed, which threw up a strip of the plains of India forming the Sewalik Hills, and increased the elevation of the Himalayas by many thousand feet. This event, and the climatal changes which it involved, caused the extinction of the Tibetan and Sewalik Faunas. Dr. Falconer then discussed the climatal conditions of the case, and the changes implicated in these upheavements. He inferred that India is now enjoying "the summer of the great cycle;" that, in contrast with what has taken place in Europe, there has been no decrease of temperature in that country, which has now as warm a climate, if not warmer, than it ever had, during any part of the tertiary period. He endeavoured to show that the Sewalik Fauna may have lived through a period equal to that occupied by several divisions of the tertiary epoch in Europe. A great addition to the height of the Himalayas was inferred to have been made at a very late period.

At the conclusion of the lecture, CHARLES LYELL, Esq., at the invitation of the President of the Society, made some remarks on the subject of Dr. Falconer's discoveries. He said he could bear ample testimony to the value of the discoveries made by Dr. Falconer and his coadjutors in India, and expressed his belief that no Government expedition in a distant country had ever done more than they had by their private exertions to enlarge our knowledge of Natural History and Geology, and enrich our national Museum with important treasures. Dr. Falconer and Captain Cautley had been separated from the rest of the scientific world, when prosecuting their investigations, and had no access to large libraries or collections of osteology, while they were determining the specific characters of new fossil animals, and founding new genera, some of which supplied links, as they had pointed out, between widely distant genera, or families previously known. It is therefore highly creditable to their skill and scientific acquirements, that the justness of their views and determinations had since been confirmed by Mr. Owen, and other eminent comparative anatomists in Europe. This collection of organic remains from the Sewalik hills derives a novel and peculiar interest from the circumstance of their affording the first example of a large number of fossil Vertebrata (with very few exceptions of extinct species) procured from a country where the climate may be presumed to be as hot now, as at the period when the fossil animals flourished. The fact of some of these Sub-Himalayan fossil Vertebrata having been ascertained by Dr. Falconer to be identical with species still living in the same region, may perhaps be explained by a considerable similarity of temperature in ancient and modern times. Nevertheless Mr. Lyell conceives that intermediate changes of climate may have been among the most influential causes which exterminated the greater part of the Fossil Fauna of the Sewalik hills, and he suggests that the colder temperature of that comparatively modern era, when erratic blocks were drifted by ice from the poles towards lower latitudes in both hemispheres, may have destroyed numerous species in India.

To determine the relative age of the Sewalik fossils, a more careful comparison of the fossil shells brought home by Dr. Falconer with a larger collection than we yet possess in London of recent Indian species, will be necessary. So far as they have yet been compared a decided majority of the fossils appear to be of extinct or unknown species, and Mr. Lyell would not be surprised if the Sewalik strata should prove to belong to the older Pliocene, or even the Miocene period, in which latter epoch in Europe the Palæotherium lived contemporaneously with the Mastodon, Elephant, Hippopotamus, Dinotherium, Ape, Crocodile, and other recent and extinct genera of mammalia and reptiles, constituting a Fauna in many points analogous, and scarcely less rich or remarkable than that of which the remains have been so successfully investigated by Dr. Falconer and others in India. Mr. Lyell concluded by expressing a hope that the results of these elaborate researches would speedily be made known to the public, and that the Government and East India Company would contribute funds towards the Osteological and other necessary illustrations.

The MARQUIS of NORTHAMPTON begged to say a few words on the important nature of the discoveries which had just been laid before them, in addition to the able observations of Mr. Lyell. It was fortunate, he said, that these discoveries were made in a region which formed a portion of a civilized empire, so that they might not be lost as soon as found, but communicated to the world. The situation of our country—"penitus toto orbe divisa"—made it more incumbent upon us as a nation to publish the results of our scientific enterprises: we were less accessible than the other countries of Europe; and although at this moment we were honoured by the presence of an Emperor and a King on our shores, such visits were necessarily few and far between. He thought that the publication of such extensive investigations and important discoveries, as those of Captain Cautley and Dr. Falconer, in geology, should be matter of national concern; and, as President of the Royal Society, and one of the trustees of the British Museum, he felt it incumbent upon him to express his opinion, that the learned Societies of England should unite to call upon the Government of the country to afford means for so doing; and he had little doubt that the call would be successful. He would not sit down without expressing his sincere thanks to Dr. Falconer, for the intellectual treat he had afforded his hearers.

LORD AUCKLAND concurred fully with the noble Marquis; and said that the Royal Asiatic Society would be most happy to co-operate with the Royal Society, or with any other institution, in furthering so valuable an enterprise.

Art. VI.—*On the Identification of the Mustard Tree of Scripture; by* J. Forbes Royle, M.D., F.R.S., L.S. *and* G.S., &c., *Professor of Materia Medica and Therapeutics, King's College, London.*

[*Read March* 16, 1844.]

Numerous attempts have at different times been made by a variety of authors to identify the two plants which in the authorised version of the Scriptures are translated *Mustard Tree* and *Hyssop*. That these attempts have not been so satisfactory to others, as to set the questions at rest, is evident from fresh plants being continually adduced, even in recent works, as possessed of the requisite characteristics. It may be inferred that these do not appear, to the author of this paper, to have been more successful than preceding endeavours, from his making a fresh, and which to many will appear a presumptuous attempt to determine what has baffled so many able inquirers. Few fields, however, are so barren, even after they seem to have been cleared by the most skilful reapers, as not to yield some grains to the careful gleaner. So, continued attention to any one pursuit, never fails to throw light, not only on itself, but also on other, and what at first appear but remotely connected subjects. Thus it has been in the study of *ancient* for the purpose of elucidating *modern Materia Medica*, and of both in connexion with the Botany of the East, that the author has been led to conclusions, which seem to elucidate some of the disputed points in Biblical botany.

As this may require explanation, I may here mention, as I have already related[1], that my attention was first directed to the identification of the natural products mentioned in ancient authors, in consequence of having, in 1825, while in medical charge of the station of Saharunpore, and of the Honourable East India Company's Botanic Garden there, been requested by the Medical Board of Bengal to investigate the medicinal plants and drugs of India. This was for the purpose of ascertaining how far the public service might be supplied with medicines grown in India, instead of their being nearly all imported from foreign countries. In endeavouring to effect this important object, my attention was in the first place directed to making myself acquainted with the different drugs which the natives of India are themselves in the habit of employing as medicines. For this purpose I found it absolutely necessary to examine the things themselves, as well as to ascertain the names by which they were commonly known. I soon found that in this inquiry, it was necessary to become acquainted with the written works in the possession of the natives of India, as well as with their personal and traditional information. I therefore caused the works on Materia Medica to be collated by competent Hakíms and Moonshees, among whom I would mention, as my principal assistants, Sheikh Nam Dar, commonly called Nanoo, the head medical assistant in the Civil Hospital of Saharunpore, and Murdan Aly, the chief plant collector, and keeper of the Herbarium in the Saharunpore Botanic Garden. By them the arrangement of these works, according to the Arabic alphabet, was persevered in; but the substances mentioned in each were arranged under the three heads of the Animal, the Vegetable, and Mineral Kingdoms. The works which were collated[1] extend from A.D. 1392 to 1769, the first having been written shortly after the close of the classic age of the School of Bagdad, the authors of which the Persian writers constantly follow. Al Buetar or Ibn Buetar, frequently quoted by Bochart in his Geographia Sacra, is the last of the distinguished Arabs. He died in 1248; the first translations into Arabic from the Greek and Sanskrit having been made about A.D. 748, or just five hundred years before the death of Ibn Buetar, during the Kaliphat of Al-Mansur. During this period lived Haly Abbas, Mesue, Serapion, Rhazes, and Avicenna.

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[1] Proceedings of the Royal Asiatic Society, 19th March, 1836.

These were themselves indebted for much of their information respecting drugs, to Dioscorides. But to his description the Persians have fortunately appended the Asiatic synonymes, and have given some account of Indian products not mentioned in the works of the Arabs. I myself made a catalogue (still in manuscript) of the whole, in which, after the most usually received, that is, the Arabic names, I inserted the several synonymes in Persian and Hindee, as well as in metamorphosed Greek. I obtained the articles, and traced them to the countries whence they were said to be derived, as well as to the animals and plants which were said to produce them; and made notes of any remarkable characteristics, and the medical uses to which they were applied.

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[1] Ikhtiarat Buddee, who completed his work in 770 of the Hejira, or A.D. 1392. He is said to be the first who wrote on Medicine in the Persian language.

Tohfet-al-Moomineen, written in A.D. 1669, by Meer Mohummud Moomin; a native of Tinkaboon, in Dailim, near the southern shores of the Caspian Sea.

Ulfaz Udwiyeh, compiled by the physician of the Emperor Shah Jehan; translated into English, by Mr. Gladwin, and printed in 1793. This is useful, as giving the synonymes in Arabic, Persian, and Hindooee, in the Persian character.

Mukhzun-al-Udwiyeh, or Storehouse of Medicines, written A.D. 1769, and printed at Hoogly, in 1824.

The Taleef Shereef, translated from the Persian by Superintending Surgeon Playfair, and published in Calcutta in 1833, has been referred to in a few instances.

Since my return to this country in 1832, having obtained copies of the Latin editions of Mesue, Serapion, Rhazes, and Avicenna, I have in many instances collated them with my manuscript catalogue.

Being without any suitable library for such investigations, and able only to obtain a small copy of Dioscorides, (12mo, Parisiis, 1549,) I was in most cases obliged to depend upon myself, for the identification of the several substances. The results of many of these investigations are briefly recorded in the observations on the history and uses of the different natural families of plants in my Illustrations of the Botany, &c., of the Himalayan Mountains. I also made use of these materials in my Essay on the Antiquity of Hindoo Medicine, in tracing different Indian products from the works of the Arabs into those of the Greeks, even up to the time of Hippocrates. I inferred that tropical products could only travel from South to North; and that the Hindoos must have ascertained their properties, and used them as medicines, before they became sufficiently famous to be observed and recorded by the Greeks. Having thus traced many of these Eastern products to the works of almost contemporary authors, I was led to conclude, that many of them must be the same as those mentioned in the Bible, especially as there is often considerable resemblance between the Arabic and Hebrew names; as, for instance:—

HEB.	ARAB.	
Abattachim	Buteekh	Melons and Water-Melon
Adashim	Adas	Lentils
Butzal	Butzl	Onions
Botnim	Butum	Pistacio Nut
Cammun	Kumoon	Cumin
Carcom	Kurkoom	Saffron

Some, again, would appear to have an Indian origin; as, for instance, Ahalim, translated Aloes wood, which is, with very little doubt, the same as the Malayan Agila, or Eagle wood, famed in ancient as in modern times. So Karpas, occurring in Esther I. 6., is translated *green* in the English Bible; but being placed between the words which signify the colours white and blue, it would naturally appear to be the thing coloured, which was, no doubt, cotton, Karpas, from the Sanskrit Karpasa, now in Hindee Karpas and Kapas. And, it is further said, in the description of the court of the garden of the King's palace at Susa, that these white and blue hangings were fastened with cords of fine linen and purple to silver rings and pillars of marble. Of this we have a vivid representation in what may every day be seen in India, especially in the Hall of Audience at Delhi, where huge padded curtains, called Purdahs, (and usually in stripes of white and red, or blue and white,) may be seen suspended from the tops of slender pillars. For this purpose, indeed, the rows of pillars in front of the principal ruins of Persepolis appear to have been intended.

While residing in, and becoming acquainted with the manners of the East, I have often, in reading the Scriptures, been struck with the brevity and force with which the sacred penmen, in describing what was then before them, give a graphic picture of the living manners of the day. In the absence of medals, monuments, and inscriptions, and where the mouldered ruins of mighty cities allow us with difficulty to trace out even their sites, we are presented with the astonishing spectacle, that manners, which in Europe are fleeting and changeable as the wind, in the East, give living representations of those which characterised the residents of the very same regions, more than three thousand years ago. So conspicuously is this the case, that works have been written describing the manners, customs, and other characteristics of the East, for the express purpose of elucidating obscure passages in the Scriptures, as Roberts' Oriental Illustrations of the sacred Scriptures. Some again, as Dr. Taylor, in his Illustrations of the Bible from the Monuments of Egypt, and Athenæum, Nos. 507, 508, and 509, have had recourse to the works of Rosselini, Champollion, Wilkinson, and others, on Egyptian antiquities, as revealing most minute particulars of the public and private life of the Egyptians, and thus affording "important because undesigned confirmations of the historical veracity of the Old Testament."

It is hardly necessary to mention how the geography of Palestine, and the other countries which were the scenes of the transactions described in Scripture, has in like manner, and from the earliest times, been minutely examined for the purpose of illustrating the Scriptures. And yet even in this department, from the more careful researches, assisted by the knowledge of Arabic, of Mr. Eli Smith, unexpected discoveries have been made by Messrs. Robinson and Smith, in their most interesting and instructive travels. On this subject, these travellers observe, "There is in Palestine another kind of tradition, with which the monasteries have had nothing to do, and of which they have apparently in every age, known little or nothing: I mean, the preservation of the ancient names of places among the common people. The Hebrew names of places continued current in their Aramæan form long after the times of the New Testament; and maintained themselves in the mouths of the common people in spite of the efforts made by Greeks and Romans to supplant them by others derived from their own tongues. After the Muhammedan Conquest, when the Aramæan language gradually gave place to the kindred Arabic, the proper names of places, which the Greeks could never bend to their orthography, found here a ready entrance, and have thus lived on, upon the lips of the Arabs, whether Christian or Muslim, townsmen or Bedouins, even unto our own day, almost in the same form in which they have also been transmitted to us in the Hebrew Scriptures." Travels, I., p. 375.

I myself have long been of opinion that if similar pains were bestowed on the material substances mentioned in the Bible, and equal trouble taken to ascertain the natural history of the countries where the several events are described as having taken place, or with which there was commercial communication, much light would be thrown upon the sacred writings. For the products of nature, whether minerals, plants, or animals, are similar in nature and properties to what they were when man first made use of, or became acquainted with them. As those only which were most remarkable in appearances or properties would usually be cited, so many of those named in the Bible might be successfully ascertained, and afford most convincing proofs of books having been written at the times, and in the places to which they are usually ascribed. In this inquiry, as in that of the names of places, we have not only the traditional names of animals, plants, and minerals to assist us, but also those which are registered in the Arabic works on Materia Medica; as in these most of the useful substances of antiquity are described. Thus the cedar continues to be called *Erez;* lentils, *Adus;* the broom, translated juniper, is still known by the name *Retham:* and many others might be adduced.

Considerable success has no doubt attended several of the attempts of naturalists to identify the natural history of the Bible. Confining our attention on the present occasion to plants only, we have Olaus Celsius, a friend of Linnæus, who did for the plants of the Bible what Bochart had done for the animals, and quite as well. He gave the labour of fifty years to the elucidation of the plants of the Bible; and seems to have exhausted the learning of the subject, as far as illustrations from Greek and Roman writers, as well as from the works of the Jews, and of many Arabic authors are concerned. He also travelled in the East, and being acquainted with botany, first gave precision to our knowledge. Hence many of his determinations of the plants of the Bible remain undisputed. Other plants have been determined by the few naturalists who have visited the Holy Land for the purpose of identifying those of the Bible. Belon, who travelled in the East for three years (1546—1549), has given considerable attention to the plants and animals of the Bible, in his "Observations sur Plusieurs Singularités et Choses Mémorables trouvées en Grèce, Asie, Judée, Egypte, Arabie, et autres Pays Etrangers: Paris, 1588." Rauwolf, in the same century (1576—1579), travelled in Palestine, Syria, and Mesopotamia; and made it his especial business to make himself acquainted with the plants of those regions. His travels were translated into English under the auspices of Ray, and thus frequently escape notice, as the two volumes are usually called Ray's Travels. These have the advantage of valuable catalogues prepared by Ray, of the plants found in the East by Belon, Rauwolf, and others. Rauwolf's own plants were published in the Flora Orientalis of Gronovius; Leyden, 1755. Hasselquist, an enthusiastic pupil of Linnæus, travelled in the Holy Land for the express purpose of examining the plants of the Bible. He died at Smyrna in 1752. His papers were published by Linnæus himself, and a translation into English in 1766, and the Flora Palestina in Linnæi Opuscula. Besides these, Labillardière, Bové, Aucher-Eloy, and other travellers, have made us acquainted with many of the plants of Palestine. But we are still without a complete Flora of the Holy Land. Russel has given a list of the plants of Aleppo; and Forskal, Delisle, and others, of many of those of Egypt and Arabia.

Notwithstanding the exertions of these several naturalists, many of the plants of the Bible still remain undetermined, and by some commentators, nothing is considered so uncertain, as the determinations which have already been arrived at. Though each of the above authors has ascertained some plants, or confirmed the determinations of others, the success has yet not been so complete, as might have been expected from the exertions which have been made. I am not aware of any modern botanist having applied himself to the study of the Flora of Palestine, for the purpose of elucidating the natural history of the Bible.

The difficulties of identifying objects known to the ancients are no doubt considerable, as a knowledge is required, not only of Natural History, but also of some of the vernacular languages, to hold converse in, with the natives, and consult the works in which the useful plants or products may be described. We are besides without the proper means for making satisfactory investigations. We do not yet possess a detailed Flora of Palestine, with the native names, properties, and uses of the several plants, and the situations in which they are found. With a simple Flora only, we should be at a loss among some thousand plants, to determine upon the hundred or so which are mentioned in the Bible. The properties which any particular plants possess, or the uses to which they are applied, necessarily restrict the attention to a smaller number, while the present native name might in some cases, from its similarity to the Hebrew, lead us to an identification, which we should have been at a loss for, without this assistance. But even this is not sufficient, for we shall find that though some of the vernacular names are somewhat similar to the ancient Hebrew, yet this is not the case with many others. Yet these plants may have names in some of the cognate languages, which are so similar to the Hebrew, as to leave no reasonable doubt of their original identity. Even some of the Greek and Latin names are not so dissimilar, but that we may often suspect that they indicate the same thing. Many however of the substances mentioned in the Bible were the produce of commerce, and obtained from distant countries. For these, a knowledge of the natural history and languages of Syria and Palestine are without value. We must follow the routes of commerce, and trace them to the countries whence they are said to have been obtained. We shall find in many instances that similar substances continue to be produced in those countries, are still objects of commerce, and continue to be used for the same purposes, and in some cases, present us even with so great a similarity in name, as to give us every reasonable assurance, that we clearly identify in the present product, the ancient article of commerce.

It was in identifying some of these articles of ancient commerce, said to be the products of India, that my attention was first directed to the subject. In following Indian products with Indian names, from India to Greece, as mentioned and described in the works of the Greeks, I inferred, as I have already stated, that their properties must have been investigated, and the substances made use of by the natives of India, before they could become known to distant nations, and become articles of foreign commerce. Hence I conceived myself entitled to infer the antiquity to a certain degree, of medicine among the Hindoos (*v.* Essay on the Antiquity of Hindoo Medicine). In the course of these inquiries I perceived that the same course of investigation could be usefully pursued, for ascertaining some of the substances mentioned in the Bible; in fact, many of them appeared to be the very same substances as those mentioned by the Greeks.

The works of nature through all ages retain uniformity of structure and of properties. Those most conspicuous for such as were useful or agreeable, would be the first to be employed in early times. By these properties, and by the names in the vernacular languages, which also retain a surprising degree of uniformity to their ancient forms, we are led to considerable certainty in our results. We must, however, examine the history of the several substances in the only works which contain any detailed or special notice respecting them, that is, in those of Materia Medica, or the Accounts of Drugs. Among these in ancient times, as in the present day among Oriental nations, we shall find, that almost everything is mentioned which has any property either useful or agreeable. With this study we must conjoin a knowledge of the Natural History, or the Mineralogy, Botany, and Zoology of the countries whence the substances were obtained. We shall thus attain a degree of certainty in our results, which to many will appear surprising, and which will give a degree of precision and correctness in our inferences and conclusions, respecting the commerce and intercourse among ancient nations, of which the subject, from its remoteness and dearth of facts, did not seem to be susceptible.

In prosecuting such researches, it is, I conceive, in the first place, necessary to determine the principles upon which they should be conducted, and also, what kind of evidence we should consider satisfactory, as determining that any particular points had been made out. Some of these points may appear too obvious to require being insisted on; nevertheless they have been entirely neglected in some investigations on these and similar subjects.

Confining ourselves at present to Biblical plants only, it is essential that any plant adduced, should correspond in properties, with that, it is supposed to be. 1st. It ought to be found in the countries where it is described, or to which allusion is made. 2ndly. It should possess the properties, or yield the products ascribed to it by the sacred penmen, or we ought to be able to show that such opinions were, or are still entertained respecting its properties and products. 3rdly. As the above would only amount to probability, in consequence of the numbers of plants growing in the same situation, and often useful for the same purposes, the plant ought to have a name in some of the cognate languages, either ancient or modern, or better if in both, which has some similarity to the Hebrew name. In the same way with an article of commerce, we ought to be able to prove that it is, or was, obtained from the direction, or the countries named or pointed out, and that it has the properties which are ascribed to the ancient drug. We ought also, if possible, to show that it has a name in some of the languages of ancient or modern commerce, which is similar to that employed in the Hebrew or Greek languages, or one of which that employed in these languages, seems to be only a translation.

Taking these principles as my guide, I shall endeavour to keep them closely in view in determining the plant which is translated MUSTARD TREE; and subsequently, I shall treat of HYSSOP in a similar manner.

The Mustard Tree of the New Testament has frequently engaged the attention of commentators. It still continues undetermined, because the common mustard plant is considered not to possess all the requisites; and it is difficult to find a plant in which are combined all the peculiarities of that alluded to in Scripture; that is, one producing a small seed; being sown in a garden; growing into a herb, and then into a large tree, which afforded shade and shelter among its boughs to the fowls of the air. In order to ascertain whether we can find any such plant, it is necessary to examine the passages in which the mustard tree is mentioned, that we may know the characteristics by which it was, and should in the present day, be found to be distinguished.

The mustard tree is first mentioned in one of the parables spoken by our Saviour at the sea-side; Matthew xiii. 31, "The kingdom of heaven is like to a grain of mustard seed, which a man took, and sowed in his field:" (32,) "Which indeed is the least of all seeds; but when it is grown it is the greatest among herbs, and becometh a tree, so that the birds of the air come and lodge in the branches thereof." The same parable is mentioned in Mark iv. 31; and the tree is recorded as shooting out great branches, "so that the fowls of the air may lodge under the shadow of it." And in Luke xiii. 19, The kingdom of God "is like a grain of mustard seed, which a man took, and cast into his garden; and it grew, and waxed a great tree; and the fowls of the air lodged" (*κατεσκηνωσεν*, built nests, Matthew and Mark, *κατασκηνοῦν*, make their abode) "in the branches of it." The mustard tree is also mentioned by our Saviour in Matthew xvii. 20, "If ye have faith as a grain of mustard seed," *ως κοκκον σιναπεως*; an expression used metaphorically among the Jews, and meaning the smallest part: and nearly in the same words in Luke xvii. 6. In the original, the grain of mustard seed is called "*κοκκῳ σιναπεως*," and described as the smallest of seeds, "*μικροτερον μεν εστι παντων τῶν σπερματων*," which grows into a *δενδρον*, or tree; St. Luke says that it becomes a great tree, *δενδρον μεγα*.

Considerable difficulty has been experienced in elucidating these passages, in consequence of the term *λάχανον*, usually denoting *garden* *herbs* in opposition to wild plants, being employed to designate the plant which was produced from the κοκκον σιναπεως, the grain of mustard seed. Though distinguished as the smallest of seeds sown in a κηπος, garden or plantation, this grew also not only into a δενδρον, tree, but into a δενδρον μεγα, great tree.

Making all due allowance for the figurative and the Oriental form of expression, it does seem evident that the plant here indicated was *arboreous* in habit; though it certainly may appear contrary to nature that a herb of the garden should ever grow into a tree, in the great branches of which birds would build their nests. Indeed, if we were to take this term literally, most herbaceous plants would be excluded, as few are fit for such a purpose, at the season when birds build their nests. On this it might be observed, that both in Syria and Egypt, the crops being sown in autumn and reaped in spring, the plants might be sufficiently grown for the purpose. But here again we may reply, that their instinct would lead them to select a more secure locality, than a crop which was constantly disturbed by the cultivator and watchmen, and liable to be cut down. It is however quite possible to have a tree, cultivated almost like a herb, as may be seen in the Mulberry cultivation of Bengal, where the object is to have soft and herbaceous leaves, as food for the delicate silk-worm.

Commentators have usually taken it for granted that the common mustard plant, or some nearly allied species, is the plant; and have attempted various modes of explaining what appears to them the several discrepancies in the parable of the Mustard Tree. Sir Thomas Browne says, "If we recollect that the mustard seed, though it be not simply and in itself the smallest of seeds, yet may very well be believed to be the smallest of such as are apt to grow into a ligneous substance, and become a kind of tree." This is probably the proper view to take of the subject, especially as we are informed by Buxtorf, as quoted by Rosenmüller (Botany of the Bible, p. 104), that the later Hebrews used proverbially to compare to a mustard seed, any thing very small and insignificant; and he refers for the proverbial use of the expression *Garghir hachardal,* to Buxtorf's Lex. Chald. Talmud, p. 822. On this, Rosenmüller remarks that, "In a proverbial simile, no literal accuracy or strictness is to be expected, and we ought therefore not to be surprised that the mustard seed is spoken of as being 'smaller than all other seeds,' although it is well known that smaller seeds are to be found."

Most have adopted the idea, that the parable of the common Mustard Seed producing a large tree may be best explained by supposing that this is caused by luxuriant growth in a richer soil and warmer climate. Dr. Clarke, for instance, observes, "Some soils being more luxuriant than others, and the climate much warmer, raise the same plant to a size and perfection far beyond what a poorer soil, or a colder climate, can possibly do." On this I may observe, that it does not by any means follow that plants which are at home and flourish in the soil and climate of Europe, will, when cultivated in a warmer and at the same time drier climate grow more luxuriantly. The majority of them will, on the contrary, wither away or be dwarfed.

In conformity to the foregoing view, Scheuchzer has described and figured (Physica Sacra, Tom. viii., p. 59, Tab. DCLXXXIII) a mustard plant which grows several feet high, with tapering stalk; and which spreads into many branches. The *Sinapis erucoides* of Linnæus, is also adduced as a species attaining considerable size, and having a wood-like structure. Captains Irby and Mangles, in their journey from Bysan to Adjeloun, met with the mustard plant growing wild, as high as their horses' heads.

Mr. Frost, a few years since, published a small pamphlet which obtained considerable attention among literary men, in which he attempted to prove that *Phytolacca dodecandra* was the δενδρον μεγα of the Scripture, and its seed the κοκκον σιναπεως. He asserts that the above plant grows abundantly in Palestine; that it has the smallest seed of any tree; and attains as great, or even greater altitude than any other in that country, of which it is a native. As the only attempt at anything like a proof is, that the North Americans call *P. decandra, poke weed,* or wild mustard, this opinion has never received the support of scientific men, because it is not known that the plant adduced has ever been found in Palestine, or even in Asia.

Before proceeding further, it is necessary to determine what are the characteristics of the Mustard Tree of Scripture, and what we must look for, in any plant supposed to be it.

In the first place, it appears to me that it must be what is strictly called a tree, perennial in nature, and woody in texture; and growing to some considerable size. It ought, moreover, among the trees of the forest, to have a small seed, for it does not appear necessary that its seed should be the smallest of all seeds. Nor indeed is it probable that the smallest seed of any tree, or indeed of any garden herb, is the smallest of all seeds. 2ndly. The Sinapis or Mustard Plant of Scripture, if not what is now commonly understood as the mustard plant, or some analogous species of Sinapis, ought to be a tree having similar properties. For we shall find that the ancients often grouped together plants and drugs, not so much from resemblance in external appearance as from the possession of similar properties. Thus the black and white Hellebore, the black and white Bryony, the greater and lesser Centaury, were produced by plants having no external resemblance to each other; but the drugs which they yield have similar medical properties. 3rdly. The plant ought to have a name in the language of the country similar to that, by which the common mustard plant is itself distinguished.

None of the plants hitherto adduced appear to me satisfactorily to meet the difficulties of the subject. Much more to the purpose, though little taken notice of, are the quotations from Talmudical writings, which are, however, disparaged by Rosenmüller and others, because they seem to suppose that the passages alluded to, apply only to the common mustard plant. Thus the Babylon Talmud says, there was left to a man in Schechem, by his father, a mustard tree having three boughs of *chardal,* and one of the number being taken was found to afford nine cabs of mustard; and its wood was sufficient to cover the shed of a potter. So in the Jerusalem Talmud, R. Simeon Ben Chalogta says, "A chardal tree was in my field, which I was wont to climb, as men climb into a fig tree." Instead of animadverting on these passages, as if they were exaggerated statements respecting the common mustard plant, it would have been more philosophical to have inquired whether there was any tree of Palestine to which the above description and name could apply: and also, what was likely to have been the name by which our Saviour spoke of the mustard tree, when addressing in parables the people of Syria in the language of their country.

The language in which our Saviour addressed his parables was no doubt the Hebrew or one of the cognate dialects, as the Syriac or Western Aramaic, which formed the common language of Palestine at that time; and both are so closely allied to the Arabic, that many words are identical in all three. Thus the above *chardal,* in the Hebrew signifying mustard, is no doubt the same word as the Arabic خردل *khardal,* signifying mustard, and mustard seed, throughout the East. But the New Testament having been written in Greek, we have only the Greek *sinapis,* where the Arabic *chardal* may have been spoken. Though this word *chardal* is not found in the Old Testament, a word very similar to it (חרול *charul,*) occurs in no less than three passages, in all of which it is translated *nettles* in the authorised version. Thus in Proverbs xxiv. 30, 31, "I went by the field of the slothful, &c., and, lo, it was all grown over with thorns, and nettles (*charullim*) had covered the face thereof." Again, in Job xxx. 7, it is said, "Among the bushes they brayed: under the nettles (*charullim*) they were gathered together." And, thirdly, in Zephaniah, ii. 9. As translators and commentators have no means of determining what plant is intended, different ones, chiefly of a thorny nature, have been fixed upon by different authors. Nettles have however had the greatest number of suffrages: but we have no proof that *charul* means a nettle, neither does it appear needful that it should; or that a thorny or prickly plant is necessary to complete the sense of the passage. For in the first passage, it only appears that fields which are uncultivated or neglected become covered with weeds; and in the passage of Job, such as, idlers may take shelter in, or take refuge among. The Arabic *khardal*, being evidently the same as the Hebrew *chardal*, and this being very similar to *charul*, I feel disposed to think that it may have the same meaning, or be applicable to one of the kinds of khardal or mustard; and we know that nothing so readily springs up in neglected corn-fields as the *charlock*, *chadlock*, or *kedlock*, as it is called in different parts of this country, and which is the *sinapis arvensis* of botanists. (Art. *Charul*, Cyclop. Bibl. Literature.)

Before proceeding to shew to what plant the term *khardal* appears to be applied in the present day, I may first mention how my own attention was directed to the subject. This was in consequence of being asked, some time last year, by the Right Rev. the Bishop of Lichfield, then Principal of King's College, London, whether I was acquainted with what was supposed to be the Mustard Tree of Scripture. I replied that I was not, as I had paid attention chiefly to those substances which had formed objects of ancient commerce, rather than to the natural products of Palestine; but that I had no doubt that some plant indigenous in that country would be found possessed of the requisite qualities. His Lordship then informed me that Mr. Ameuny, a native of Syria, and student of the College, then attending the theological class, had said, that he was perfectly well acquainted with it. Dr. Lonsdale added, and that his description of the tree seemed to correspond with everything that was required. On seeing Mr. Ameuny, and asking him whether he knew any tree which answered to the Mustard Tree of Scripture, he replied, that he was perfectly well acquainted with one; had often seen it, as it was common in the neighbourhood of Jerusalem; and that it was large enough for a man to stand under on horseback. I asked him what it was called; he replied, that it was everywhere known by the name of *khardal*. I observed, that that is the common Arabic name for mustard. He said, "So it is; and it is also applied to the seeds of this tree, which are universally employed throughout Syria as a substitute for mustard, of which they have exactly the taste and properties."

Mr. Ameuny was unable to give me any further information respecting it.

Previously to this, but without paying any particular attention to the subject, I had conceived that Vitex Agnus Castus might be the Mustard Tree of Scripture, as it grows to the size of a good-sized shrub, with woody stem, and its seeds have sometimes been called *piper agreste.* I also thought that it might be one of the larger Capparideæ, which grow to a considerable size, have berried fruit containing numerous small seeds, and one of which is described by Belon as "Capparis Arabica fructu ovi magnitudine, semine piperis instar acre." The flower-buds and seeds of the caper of Mount Sinai, *capparis sinaica,* are pickled; and the latter are called *filfil-i-jibbul,* mountain pepper. But as there did not appear any proof in favour of any of these, the investigation was not pursued.

Having ascertained that the name *khardal* was in the present day applied to a tree in Palestine, the next point was to ascertain its name and nature, so that it might be seen whether it was in all points answerable to what was required. In referring to the ordinary Arabic dictionaries, and lists of drugs in the Latin editions of Avicenna, Serapion, and Rhazes, *chardal* and *cardel* are given as synonymes of sinapis only. In the Ulfaz Udwiyeh, translated by Mr. Gladwin, three kinds of خردل are mentioned: 1*st*, No. 844, *khirdul;* Hindee, *reiy*, mustard. 2*nd*, No. 784, where *khirdul biree* and *junglee-rie*, translated wild mustard, are given as synonymes of *hirasha roomee;* and the 3*rd* kind, No. 853, is *khirdul farsee.* In my own catalogue of Asiatic Materia Medica, خردل khardal, is given as the synonym of *raee*, that is, mustard. Sinapis juncea, &c. (Decand. Prod. ii. 612.) is the khurdal of Forskal, according to Delisle; and this is clearly allied to sinapis integrifolia, &c. (Decand. ii. 612.) 2. خردل بري *khardal burree*, or *junglee raee*, wild mustard, is the second, though it is difficult to say what plant is intended. 3. *Khardal roomee*, Persian, *hirasha roomee*, translated in Hindee *junglee raee*, or wild mustard, of which the seeds, like those of the former kinds, are described as being stimulant. But neither in this list nor in the previous quoted Ulfaz Udwiyeh, was I able to obtain any information respecting the nature of the plant. But the term *roomee* is by Asiatics usually used in reference to Constantinople, or to the Turkish empire; and I may observe that, the kind called *hirasha farsee*, or Persian mustard, in the Ulfaz Udwiyeh, is called *khardal roomee*, or Turkish mustard, in my notes.

Finding by this investigation that several kinds of khardal, or mustard, were known to Asiatics, and that this name was applied to a tree of Syria, it was extremely desirable to obtain, if possible, its name in scientific works, so that we might ascertain whether it possessed all the characteristics of the mustard tree. For this purpose, among other places, I referred to the index of my Illustrations of Himalayan Botany, where several Arabic names are mentioned, together with the names of the plants to which they are applicable. In this I did not find *khardal*, but a word so similar to it, that I was induced to refer to it, in the body of the work; and was surprised to find that it referred to a tree which, not only in name but in properties, corresponded very closely with what is required for the mustard tree. For instance, under the natural family of Chenopodeæ it is mentioned that, "Salvadora, which is placed in this order by Jussieu, but by Bartling in Myrsineæ, is a genus common to India, Persia, and Arabia; and the same species, *S. persica*, occurs in the Circars, north of India, and the Persian Gulf. Along with this another species is found on the banks of the Jumna, and from Delhi to Saharunpore. This is *S. indica*, *nob. jāl* of the Hindus, *irak hindee* of Persian authors, who also give this tree the name of *Miswak*, or tooth-brush tree[1]. *S. persica* is called *Khurjál* in North India, *arak* and *irak* in works on Materia Medica. The bark of the root is acrid, and raises blisters. (Roxb.) A decoction of the bark of the stem is considered tonic, and the red berries are said to be edible." Royle, Illust. Bot. Him. Mountains, p. 319.

On referring to the work of Dr. Roxburgh mentioned above, the Flora Indica, vol. i., p. 389, it may be seen that a figure is given of the tree in his Coromandel Plants, vol. i., pl. 26, of which the Telungu name is *Pedda-warago-wenki*. He describes it as a middle-sized tree, a native of most part of the Circars, though by no means common; it seems to grow equally well in every soil; produces flowers and ripe fruit all the year round. This fruit consist of "berries very minute, much smaller than a grain of black pepper; smooth, red juicy, seed one."

Of the properties of the plant Dr. Roxburgh continues to say: "The berries have a strong aromatic smell, and taste much like garden cresses. The bark of the root is remarkably acrid, bruised and applied to the skin, soon raises blisters, for which purpose the natives often use it; as a stimulant, it promises to be a medicine possessed of very considerable powers." Roxb., l. c., p. 390.

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[1] Can this be the plant to which Burckhardt alludes as the tree of which the Affghans make tooth-brushes on their pilgrimage to Mecca?

This plant was described in 1780 by Retz, in Obs. Bot. iv., p. 24, under the name of *Embelia grossularia*, who stated that he obtained it from König, from Tranquebar. His description agrees in all respects with that of Roxburgh. Colonel Sykes found it in the Dekhan; and it is mentioned in his Manuscript Catalogue, p. 250, as known to the natives by the name of *meru*. In the catalogue of the plants growing in Bombay and its vicinity, *Salvadora persica* is mentioned as growing near the sea in both Concans.

The late Sir A. Burnes, in his voyage up the Indus, mentions *Salvadora persica* (Travels, vol. iii., p. 122) under the name *peeloo*, as met with near Mooltan, and in all the tracts of saline soil that border on the Indus and Punjáb rivers; and especially in the Delta of the Indus, and lower parts of Sinde; and states that its seeds in taste resemble water-cresses, and that he found the fruit exposed for sale in the bazars of Mooltan. He supposes it to be the plant alluded to in Arrian's Indian History, as having leaves resembling those of the laurel, and growing in places within the influence of the sea. But there does not appear to me any proof of this identity. Lieutenant Welsted also mentions it as occurring on the southern coast of Arabia.

Before proceeding further in attempting to identify this tree with the Mustard Tree of Scripture, it is desirable to refer to the original description of this plant, which we find in the Philosophical Transactions, for 1749, p. 491, in a paper written in French, by Laurence Garcin, M.D., F.R.S., of Neufchatel in Switzerland, but translated by Dr. Stack.

This plant is woody. It grows sometimes into a tree, sometimes into a shrub, and sometimes into a bush. Its native countries are the parts adjacent to the Persic Gulf, the North of Arabia, and the South of Persia[1]. It is most commonly found along high roads, and in dry and low places, delighting in the hottest and driest places, more so even than palm trees. Dr. G. had not met with it in Surat or Bengal, where there are regular rainy seasons every year. The inhabitants of the Gulf call this shrub by the name of *Tchuch*. It varies considerably in size; is usually a larger sort of shrub. It produces a number of boughs without order, and very tufted branches, which most commonly hang down to the ground. Its bark is moderately thick, sometimes smooth, sometimes full of cracks, of an ash colour, both in the trunk and branches, but green on the tender shoots. The wood is everywhere brittle, and nearly of a straw colour.

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[1] Mr. Bennett informs me that there are specimens in the British Museum from Muscat, collected by Aucher-Eloy.

The leaves in shape nearly resemble those of the sea purslain, and sometimes those of the misletoe of the apple tree. They are often covered with excrescences of different sizes and shapes—round, oval, and sometimes very large. They are the work of the flying insects which abound in those parts.

The flowers are disposed in clusters on the tops of the shoots. These bunches of flowers entirely resemble those of the vine blossom.

The pistil or embryo of the fruit afterwards swells in all dimensions, and grows into a berry, in the shape and size of a gooseberry (currant?) of three or four lines in diameter; at first it is of a pale green, then a bright purple, and in its maturity, of a dark red. Each berry is supported on a strong thick pedicle, attached to a small branch. Its substance is white transparent flesh, full of juice, much resembling jelly, which surrounds a single round grain, marbled with black or brown spots, as in the tortoise-shell, when ripe. This grain is as large as a grain of hemp-seed, that is, about two lines in diameter; but sometimes less. It is properly a kernel, or a shell that has a cavity, which incloses a sort of little round almond of a straw colour, yellowish on its outward surface, and pale in its inward substance, which is pretty firm. All the parts of our plant have an acid, pungent taste and smell, vastly like our garden cresses, but more biting. The fruit is the most pungent part of the whole. The smell of the plant is perceptible at seven or eight paces distance, when a person is to leeward.

The natives of the country use it against the bite of the scorpion, by rubbing the wounded part with its bruised leaves. They also employ its warm infusion to wash the bodies of their children, in order to keep them healthy; and they feed camels with it, who love it naturally.

Dr. Garcin finding that this plant did not correspond in characters with any previously described plant, established a new genus, and applied to it the name Salvadora, in honour of M. Salvador, of Barcelona, a very skilful botanist, of whom M. Tournefort makes mention in the Introduction to his Institutiones Rei Herbareæ, where he styles him the Phœnix of his nation, because he was really the richest naturalist, and the most expert botanical traveller that Spain ever produced. Dr. Garcin also herborized with him before the siege in 1713 and 1714; and says, "I thought it incumbent on me to do honour to his memory, by giving his name to this plant, and I have done it with the greater justice, because it is certain that had he lived, he would have given a history of the plants of Spain, which by its accuracy would have afforded much pleasure to the botanists of Europe."

This plant is also described by Forskal, in his Flora Ægyptiaco-Arabica, published by Niebuhr in 1775, under the name of *Cissus arborea*, which he found at several places, as he mentions that at Surdud it is by the Arabs called رديف *redif;* at Dabhi, راك *rák*[1]; at Hashad (*Káhsad*), the tree is called ارك *örk*, and the fruit كباث *kebáth.* He also states that it is held in high esteem by the Arabs; that the fruit is edible, when ripe; the leaves when bruised applied upon the tumours called *harm*, &c.; that it is also so famed as an antidote against poisons, as to be celebrated in a song by some Arab poet:—

اراق النبات يطلع نبات مدور
يبع ثبات من الرجال الكملي

He describes it as a shrub with smooth stem, opposite drooping branches, with the flowers arranged in terminal branches, which are afterwards followed by berries about the size of a pea, and containing a single seed.

Mr. Bennett informs me that the Salvadora persica was found in Egypt by Sir G. Wilkinson. Delisle gives us the locality "in Monte Gharab Egypti superioris." Endlicher, in his Genera Plantarum, gives as the geographical distribution of Salvadora persica, "per Asiam mediam, ab India superiore ad mare Mediterraneum, per Africam borealem a Nilo ad Senegambiam[2]."

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[1] In Indian writers we see that ارك *irak*, is applied to the same tree.

[2] Mr. Johnson, in his recently published and interesting work, intitled, Travels in Southern Abyssinia, says, "The *Moomen*, or tooth-brush tree (Salvadora persica) abounded at Sakeitaban. Several of the Hy Soumaulee brought me a handful of the berries to eat; but I was soon obliged to call out, 'Hold, enough!' so warmly aromatic was their flavour. This singular fruit grows in drooping clusters of flesh-coloured, mucilaginous berries, the size of our common red currants, each containing a single round seed, about as large as a pepper-corn. The taste at first is sweet, and not unpleasant, and by some, I think, would be considered very agreeable indeed. After some little time, if many are eaten, the warmth in the palate increases considerably, and reminded me of the effect of pepper, or of very hot cress. As we approached the river Hawash, I found these trees growing more abundantly.

"The *moomen* forms a dense bush, some yards in circuit, and as their sleek, velvety, round leaves, of a bright green colour, afford an excellent shade, they form the favorite lairs, both of savage man and of wild beasts. Reposing upon the ground, near the roots, free from underwood and thorns, whoever, or

Having traced this tree, which so singularly coincides in name and in properties with what is required for the Mustard Tree of Scripture, from the extremity and coasts of the Peninsula to the North-Western provinces of India, and from that to the Persian and Arabian Gulfs, it is necessary for our purpose to ascertain that it is also found in Palestine. But in this I was long unsuccessful, as I was unable to find any notice in systematic botanical works, or in local Floras, of the prevalence of *Salvadora persica*, to the north of the situations in which Forskal had found it. I therefore had recourse to the works of travellers, especially of those who had paid some attention to natural history; but I was still unable to find any notice of such a plant in any of the lists of the Flora of Palestine. I then referred to the excellent digest of the information on Natural History subjects contained in books of travels in Palestine, in Mr. Kitto's Physical Geography and Natural History of the Holy Land, where at p. ccLiii, with other unknown plants, I found an extract which is directly applicable to our subject:—

"Advancing towards Kerek, from the Southern extremity of the Dead Sea, Captains Irby and Mangles soon, on leaving the borders of that sea, entered into a very prettily wooded country, with high rushes and marshes. Leaving this, the variety of bushes and wild plants became very great: some of the latter were rare, and of remarkable appearance. 'Occasionally we met with specimens such as none of our party had seen before; a botanist would have had a fine treat in this delightful spot. Amongst the trees which we knew, were various species of acacia, and in some instances we met with the dwarf mimosa: we saw also the *doom*[1]; and the plant which we saw in Nubia, and which Norden calls the *oschar* (*Asclepias procera*). There was one curious tree which we observed in great plenty, and which bore fruit in bunches, resembling in appearance the currant, with the colour of the plum. It has a pleasant although strongly aromatic taste, exactly resembling mustard; and, if taken in any quantity, produces a similar irritability of the nose and eyes to that which is caused by taking mustard. The leaves of the tree have the same pungent flavour as the fruit, although not so strong. We think it probable that this is the tree our Saviour alluded to in the parable

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whatever lies there is entirely covered from sight; and not unfrequently a leopard or a hyæna skulks out of, or a startled antelope bounds from the very bush that the tired Bedouin has selected for his own retreat from the sun." Travels, vol. i, p. 424.

Moomen is also the name of pepper, Mr. Johnson informs me.

[1] Not the Doom Palm of Egypt (*Cucifera thebaica*).

of the Mustard Seed, and not the mustard plant which we have in the North; for although in our journey from Byssora to Adjeloun we met with the mustard plant growing wild, as high as our horses' heads, still, being an annual, it did not deserve the appellation of "a tree," whereas the other is really such, and birds might easily, and actually do, take shelter under its shadow.'" Travels, p. 363; and p. 107 of Mr. Murray's edition, forming a volume of the Colonial Library.

From this it is, I think, quite evident that Captains Irby and Mangles fell in with the very tree, of which we are in search and have traced to Arabia; and which they were therefore the first to recognise as the Mustard Tree of Scripture, though their discovery has not attracted the degree of attention which it deserved. Their description is brief and imperfect, yet it contains enough to have convinced me, on first reading it, that the tree was the *Salvadora persica.* The properties being the same would not prove the point, for many plants have warm and spicy seeds, though we may not have succeeded in tracing them into Palestine. But when in conjunction with these properties we have it mentioned as a tree, having its fruit in bunches, something like the currant (whence no doubt Retz's name of *Grossularia*), we have a combination which is not usual among the trees of Europe, nor as far as I am aware, among those of Syria and Palestine. It is more than probable, that it is to this tree that the name *chardal* is applied by Talmudical writers; who state that it was large enough to be climbed like a fig-tree; that its branches spread over like a tent. These statements have been considered unworthy of notice by Dr. Harris, Rosenmüller, and others. But it is without doubt to the same tree that Mr. Ameuny applies the name *khardal*, and the seed of which he informs me is usually employed in Palestine for the purposes of mustard.

On further inquiry of Mr. Ameuny, (now attending my own class at King's College,) where this khardal tree was found, he informed me that he had seen it all along the banks of the Jordan, and very abundant in the neighbourhood of the Lake of Tiberias, and near Damascus. He also stated that it was so generally recognised in Syria as the Mustard Tree of Scripture, that the Reverend Storey Hebard had carried specimens of the plant from the shores of the above Lake to Jerusalem, not as a rarity, because the khardal tree is also found there, but as specimens to send to America, from the very locality where our Saviour had spoken the parable of the Mustard Tree.

As specimens of the plant, or accurate descriptions of it by a qualified botanist, would alone satisfy others of the existence of this plant in the above localities, and knowing that my friend Dr. Lindley had seen the collections of Bové, and those made in the expedition of Colonel Chesney, I wrote to him to inquire whether among these plants he had seen any specimens of *Salvadora persica;* and he informed me in reply, that *S. persica* was found on Mount Sinai by M. Bové, but that he did not see it among the plants collected in Colonel Chesney's expedition. This is however an interesting locality, as it thus connects the Arabian localities with those in which it had been found by Captains Irby and Mangles.

Having proceeded thus far, that is, having found in India a tree called *kharjal*, which has the same properties as the *khardal* of Syria, and then ascertained that *Salvadora persica* (the *kharjal* of Northern India) is found along the Persian Gulf and the coast of Arabia, even up to the neighbourhood of Mount Sinai, I thought that I had been the first to infer from their description that this was identical with the tree found by Captains Irby and Mangles, on the southern coast of the Dead Sea. But I was surprised in looking, with a totally different object, at Dr. Lindley's Flora Medica, to find the *Salvadora persica* there mentioned, as the tree supposed to be the Mustard Tree of Scripture. Having only recently obtained this information, I have been unable to ascertain the grounds upon which this supposition was entertained, as upon inquiry of Dr. Lindley he was unable to refer me exactly to the place where the speculation had been entertained either by Mr. Lambert or Mr. Don. But as my own conclusions had been arrived at by an independent course of investigation, to which I had been led by the Asiatic synonymes of the plant which is supposed in Syria to be the Mustard Tree of Scripture, I conceive them worthy of presentation to the Society as tending to confirm those of other inquirers.

On mentioning this subject casually to Mr. Bennett, of the British Museum, and Secretary to the Linnæan Society, he was good enough immediately to seek out the information, and favor me with the accompanying remarks, which were read at the Meeting of the Asiatic Society, on the 20th of April:—

"I find that both Don and Lambert have published notes on the Mustard Tree, suggested by the communications of Captains Irby and Mangles; but that both (instead of adopting) object to the inference of those travellers, that the tree observed by them was the Mustard Tree of Scripture, at the same time that they positively identify the Captains' tree with *Salvadora persica*, L.

"Don's observations are in Jameson's Edinburgh New Philosophical Journal, vol. ii., p. 306. After quoting the passage from Irby and Mangles, he says, 'On reading this passage, both Mr. Lambert and myself felt interested in ascertaining what the tree might be, and at first we were inclined to suppose it was a species of *Phytolacca*, with which genus the habit of the plant, as far as could be learnt from the above description, pretty well accords; but the examination of an authentic sample in the possession of Mr. Bankes [Mr. William Bankes, who was in Palestine at the same time with Irby and Mangles], has proved the supposition was unfounded, and that the tree is *Salvadora persica* of Linnæus, the *Embelia grossularia* of Retzius, and the *Cissus arborea* of Forskal.' Don then quotes Roxburgh's description of *Salvadora* for the sake of comparison, and speaks of it as 'found in Arabia, Syria, Persia, and India, between the parallels of 18° and 31° N. latitude.' He goes on to say, 'I am far from assuming this tree to be identical with the apocryphal Mustard Plant of the sacred Scriptures: indeed, the whole passage in the Gospel by St. Matthew appears to militate against such an opinion, and it would appear that some common agricultural herb of large growth had been intended by our Saviour in the parable; but whether the plant belongs to the same family with *Sinapis* of Linnæus, and for what purposes it was cultivated, are questions rendered quite problematical at this distant date. We are pretty certain, however, that it cannot be a *Phytolacca;* for it does not appear that any real species of that genus has been observed in Palestine.' He believes *Phytolacca Asiatica* of Linnæus, in the list of Hasselquist's plants, forming the 'Flora Palæstina,' (*'Phytolacca foliis serratis'* of the first edition of the 'Species Plantarum,) to be probably intended for *Salvadora persica,* 'with which Linnæus does not appear to have been ever well acquainted.'

"Lambert's 'Note on the Mustard Plant of the Scriptures,' is in Linnæan Transactions, vol. xvii., p. 449. He believes the plant to be literally *Sinapis nigra;* and relies for confirmation of this on the statement of Captain Irby and Mangles of the large size to which that plant sometimes attains in the Holy Land. The following is his reference to *Salvadora*: 'What Mr. Frost says about *Phytolacca* he took from some conversation he heard in my library, not relating to the mustard seed of Scripture, but to a plant mentioned by Captains Irby and Mangles, of which they brought me a specimen, and which proved to be *Salvadora persica,* found by them growing in a hot valley of the Holy Land.'"

Mr. Bennett also called my attention to Lady Calcott, having in her work, entitled Scripture Herbal, referred to the above information obtained from Captains Irby and Mangles. This I had overlooked, from Sinapis nigra, or the common black mustard, being the plant *selected* for illustration by her Ladyship.

It has therefore been ascertained beyond doubt that the Salvadora persica is found in Palestine, in the neighbourhood of the Dead Sea; and I think, considering the wide distribution of the plant, we may be allowed to conclude that the same plant is found on the shores of the Lake of Tiberias, and that it is there called *khardal*, or mustard. To some, the evidence by which it has been concluded that this is the tree alluded to in the parable of the Mustard Tree may not appear satisfactory; and they may think, as Mr. Lambert, that the common mustard plant is suitable to all that is required, especially as it is herbaceous as stated in the first part of the parable; has a small seed, and was probably cultivated in gardens. But this mustard seed is far from being the smallest of seeds, for even in Syria we have trees, as the poplar and willow, with small seeds; but still, speaking generally, mustard seed is small, as is also that of the *khardal*, or *Salvadora persica*, for anything that grows into a tree, and that, the parable seems to me to require. Mr. Don, though not satisfied with this, is as little so, with the common mustard; and fancies that some unknown agricultural plant of large growth was intended, but which it would now be difficult to discover. But to me there appears nothing improbable in the *Salvadora persica* itself having been so cultivated, and its herbaceous parts employed, as well as its seed, as a condiment. In fact, we might infer that it was so, for Rosenmüller mentions that a plant which he supposes was the common mustard, was at least by the later Hebrews cultivated as a garden plant. This is evident from the fact, that in the Talmud (Massroth, cap. IV., § 6,) its buds are mentioned amongst things which are subject to tithe. From this he infers that it was cultivated, because according to the general rule established in the Talmud (Massroth, cap. I., § 1) everything eatable, and which is taken care of, cultivated, and nursed (in gardens, or in ploughed fields), and which has its growth from the earth, is subject to tithe. If we were to take the foregoing passage literally, it would of itself be sufficient to prove, that the common mustard plant was not that alluded to, because herbaceous plants are without regular buds; and they are moreover not grown to a great size at the season when birds build their nests.

We may briefly, therefore, sum up the result of our inquiries. Our Saviour in the parable adduces a plant having a small seed, which being sown we may suppose in a suitable soil, grows up into a tree, or, as the Apostle Luke says, a great tree, in the branches of which the fowls of the air take shelter or build their nests. This tree is mentioned in the New Testament by the Greek name *Sinapè*, or mustard, and we may infer that it was spoken of by the Hebrew or

Syriac name of mustard, which, as in the Arabic, is *chardul*, or *khardal*[1]. Whatever the plant may be, we are justified in concluding that it possessed the properties of mustard, from the same name being applied to it. The Arabs, we have seen, enumerate several kinds of khardal or mustard; that is, the common, the wild, and the Persian kinds; and it has been shown that the ancients were in the habit of grouping things together, rather by their intrinsic properties than their external characters.

Having learnt that the tree which in Palestine is at the present day recognised as the Mustard Tree of Scripture is there called *khardal*, I was led to conclude that this was *Salvadora persica* before even I could prove that this tree had ever been found in Syria. It is a curious and interesting fact, and one which we cannot consider accidental, that in so remote a country as the North-West of India, the name *kharjal* should be applied to the same tree as *khardal* is in Syria. This proves the impossibility of collusion, or the recent application of the latter name to a plant of Palestine, merely to meet the exigencies of the case, as has been done in some cases by unscrupulous monks, who usually calculate on the credulity of their hearers being in proportion to their own ignorance. Subsequently I learnt that Captains Irby and Mangles had found a tree near the shores of the Dead Sea, which I concluded from their short description must be *Salvadora persica*. This I afterwards ascertained had already been determined by Messrs. Don and Lambert, from examination of specimens brought from the very locality by Mr. W. Bankes, and we find that it is a tree known both in Persia and Arabia, in India and Abyssinia, for its gratefully aromatic and pungent seeds, which we find employed at the present day in Syria for the ordinary purposes of mustard, and which we are therefore justified in concluding is the *chardal* tree alluded to by Talmudical writers.

In conclusion, it appears to me, that taking everything into consideration, Salvadora persica appears better calculated than any other tree that has yet been adduced to answer to everything that is required, especially if we take into account its name and the opinions held respecting it in Syria. We have in it a small seed, which, sown in cultivated ground, grows up and abounds in foliage. This being pungent, may, like the seeds, have been used as a condiment, as mustard and cress is with us. The nature of the plant, however, is to become arboreous, and thus it will form a large shrub, or a tree, twenty-five feet high, under which a horseman may stand, when the soil and climate are favourable. It produces numerous branches and leaves, among which birds may and do take shelter, as well as build their nests. It has a name in Syria which may be considered as traditional from the earliest times, of which the Greek is a correct translation. Its seeds have the pungent taste, and are used for the same purposes, as mustard. And in a country where trees are not plentiful, that is, the shores of the Lake of Tiberias, this tree is said to abound, that is, in the very locality where the parable was spoken. If we consider, moreover, the wide distribution of this plant, from Damascus to Cape Comorin, and from the Persian Gulf to Senegambia, we still find that it is well suited to illustrate the typical comparison of the doctrines of the Gospel, which though at first gaining only a few adherents, would in the end spread far and wide.

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[1] Mr. Norris, Assistant Secretary of the Royal Asiatic Society, has favoured me with the following note:—"I have looked at the old Syriac version of the passages where the mustard tree is named, and find the word ܚܪܕܠܐ *khardalo*. The same is in the Chaldee. The modern Jews appear also to use the same word, for I find it in the Hebrew version of the New Testament."

ART. VII.—*Summary of the Geology of Southern India. By* CAPTAIN NEWBOLD, F.R.S., &c., *Assistant Commissioner for Kurnool.*

[*Read June* 15, 1844.]

PRELIMINARY PHYSICAL SKETCH.

AREA AND GEOGRAPHICAL POSITION.

THE area, the geological features of which it is purposed to attempt a description of, so far as known, comprises peninsular India from Bombay on the west, and Ganjam on the east coast, to Cape Comorin, lying between the 8th and 20th degrees of north latitude. Its northern limit is skirted by the Sub-Vindhyan ranges, and the plains of Central India; while the remaining sides are washed by the ocean, and lie within the 72nd and 86th degrees of east longitude.

GENERAL PHYSICAL FEATURES.

The prominent physical features of this extensive tract have originated in the elevation of two mountainous ranges, marking irregularly the coast lines, and termed the Eastern and Western Ghauts; which support on their Atlantean shoulders, and inclose as in a massive framework, the intermediate table lands, at an altitude varying from 500 to 3000 feet above the sea's level.

From the basis of both these chains tracts of low land, with irregular and often abrupt elevations, varying from a mile to seventy in breadth, extend to the sea, and have been expressively styled by Mahommedan writers Payeen Ghaut, or land at the feet of the Ghauts, in contradistinction to the table lands, which they name Bala Ghaut, or land above the Ghauts.

WESTERN GHAUTS.

The elevation of the Western Ghauts commences in Khandesh, where it meets that of the Vindhya beyond the limits of the area under description; thence, pursuing a nearly south-by-east direction, interrupted by the singular gap of Paulghautcherry, it terminates a little above Cape Comorin, near the Amboli Pass, in a bluff granite peak about 2000 feet high. A low broken range extends from its base to the southern extreme of the peninsula. The extreme ascertained elevation of the Western Ghauts above the sea occurs in the Nilgherrys,—a little above the gap of Paulghautcherry,—8760 feet. Towards the north they rise, in the Mahabuleshwar hills, to the altitude of about 5000 feet. The most striking feature in this great dislocation is the comparatively precipitous façade presented by its sea, or western side. To the east, or inland, it usually slopes away gradually, to the general level of the table lands.

Along part of the base of the western flank gushes a line of thermal springs, which have been traced from the north of Bombay southerly to Rajapore, and probably extend still further south, concealed in the forests that clothe the feet of the mountains. I have found springs of a thermal character at the western base of the Eastern Ghauts, with a temperature from 88° to 89° Fahrenheit.

EASTERN GHAUTS.

The Eastern Ghauts are supposed to rise in the vicinity of Balasore, in lat. 21° 30′ N.; and, passing a little to the west of Ganjam, pursue a southerly course to Naggery, where they appear to terminate in the bluff height called Naggery Nose, about fifty-six miles north-west from Madras. Their course is here broken apparently by another line of elevation, which, sweeping irregularly inland, crosses the peninsula in a south-westerly direction by Chittoor, Sautghur, and Salem, and joins the Western Ghauts north of the gap of Paulghautcherry. The southerly direction of the first-mentioned elevation line is marked at intervals along the Coromandel coast by outliers and detached hills, and reappears in the almost contiguous island of Ceylon as a continuous mountain range. There is little doubt from this and other geological reasons, that Ceylon was raised above the ocean by forces similar to, and contemporaneous with, those that elevated the peninsula.

It is worthy of remark that, while the steeper declivities of the Western Ghauts face generally towards the sea, those of this cross range, or rather break in the continuity of the elevation, have usually a southerly aspect.

Below, or south of this great break, which I shall call that of Salem, the Eastern Ghauts, as just stated, lose the character of a chain, and reappear at intervals in detached hills, groups, and clusters, while the general level of the peninsula ceases to be sustained as a continuous table land. Some of these clusters rises to a considerable altitude: the Pulney Hills attain an elevation above the sea's surface of between 6000 and 7000 feet; isolated patches of table land not unfrequently occur on their summits. The average elevation of the Western Ghauts may be roughly stated at 4000 feet, and that of the Eastern at 1500 feet.

Geographically speaking, these great chains are separate and distinct; but, in a geological point of view, after a careful and extended examination of the intervening table lands, I am inclined, until further evidence be adduced, to regard the Western Ghauts south of Malwan, the Eastern Ghauts and their table lands, as part of one magnificent elevation of plutonic rocks, by a succession of efforts, during a period which may be termed plutonic, breaking up the hypogene schists; and, in some instances, uplifting aqueous beds of a more recent origin.

The true general direction of this elevation is nearly N. 5° W. though the apparent directions of the lateral chains on its flanks are, as we have noticed, to the east and west of north respectively.

PHYSICAL ASPECT OF TABLE LANDS OF SOUTHERN INDIA.

The surface of the table lands between these chains, extending from the Salem break on the south, and comprising the elevated plains of Mysore, the Ceded Districts, the South Mahratta and Hydrabad countries, and the Dekhan, ably described by Colonel Sykes, though usually presenting vast plains, which to the eye often appear perfectly horizontal, has a general inclination easterly by south towards the Bay of Bengal, into which the principal rivers empty themselves. This gentle inclination, often assisted by cross lines of elevation, determines the great drainage lines of the country, throughout our area, east of the Western Ghauts, and beyond it to the northerly slopes of the Vindhya, whence another system of elevation and drainage commences. Every traveller, who has ascended the Ghauts, is struck by the singular appearance, in plutonic areas, of detached hills, and clusters of hills, starting up abruptly from the surface of the flat plains spread before him, with little or no tali, presenting a *coup d'œil* which has caused the not inapt comparison of a table with tea-cups here and there reversed on its surface. These hills are usually naked masses of gneiss or granite, and seldom rise above 500 feet from the level of the plain. Some few exceed 1200, and the highest not 1800 feet; many have been selected by the natives as the sites of the Droogs or hill-forts so celebrated in the annals of Southern India.

The mean elevation of the table land around Bangalore and Nundidroog above the sea is 3000 feet. Northerly towards Hydrabad it sinks to 1800 feet; and a little south of Bangalore it falls, by rather abrupt steps, to the level of the plains of Salem and Coimbatore, (viz. 1400 feet,) whence, to Cape Comorin, the mean height of the country is about 400 feet. The average height of the low country between the Ghauts and the sea, on both the coasts of Coromandel and Malabar, may be roughly estimated at 200 feet, rising at the base of the mountains to 800 feet. Nothing can be more contrasted than the aspect of these coast tracts: while the former presents an open and comparatively bare, sandy plain, gently rising towards the interior, the monotony of which is diversified by a few detached hilly clusters, palm, cocoa-nut trees, and topes, planted by the hands of man; the latter is broken up by a succession of low irregular hilly spurs, separated by narrow marshy flats, covered with eternal forest, and often descending to the sea in precipitous cliffs.

Through these flats and ravines a number of mountain torrents stream, in the monsoon, from the Ghauts' steep sides; and, after a short but rapid course, rarely exceeding fifty miles, fall into the sea. North of Malwan, owing to the different geological character of the country, the physical aspect of the Western Coast undergoes a considerable change, being less clothed with forest, and its lowlands generally not so much elevated above the sea. According to Colonel Sykes[1] this part of the coast to Bombay, which is usually called the Konkan, presents a long strip of land from thirty to fifty miles in breadth lying between the Ghauts and the sea; the mean elevation of this strip is less than 100 feet, but it is bristled with isolated hills, or short ranges, some of which attain an elevation equalling that of the Ghauts. Numerous shoulders or salient angles are thrown out from the Ghauts on the Western or Konkan side, and by means of these the ascent to Dekhan is effected; with what difficulty, will be understood when I state that the military road of communication between Bombay and Poona up the Bou ghat rises nearly 600 feet in a mile.

RIVERS.

The large rivers of Southern India within our area, viz., the Godavery, Kistna, Toombuddra, Cauvery, and Pennaur, flow from the eastern slopes of the Western Ghauts, and, crossing the peninsula in an east-by-southerly direction, escape through singular fissures in the Eastern Ghauts to the plains of Coromandel, and the Bay of Bengal. The Godavery passes through the break of Papcondah; the Kistna and Toombuddra through that of Beywarah, and the Pennaur through those of Ganjicotta and Sidhout. The Cauvery alone, having descended from the table land southerly by the Salem break, turns easterly and falls into the sea below the southern termination of the Eastern Ghauts as a continuous chain. The Paniani, and the mountain streams that rise west of the anticlinal ridge, or watershed of the Western Ghauts, run westerly into the Indian Ocean. These fissures, and cross valleys, run nearly at right angles with the elevation line, and offer striking illustrations of the correctness of Mr. Hopkins's theory of the origin of the cross valleys of the Weald, a district, part of which I had recent opportunities of observing, during a brief visit to Europe. The great Himálaya chain appears to present similar phenomena on a scale of greater magnitude.

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[1] Geology of the Dekhan, Transactions Geological Society, Second Series, vol. iv., pp. 409—432.

The gap of Paulghautcherry, previously mentioned, is evidently a continuation of the Salem and Nilgherry break, near the southern base of whose lofty precipices it opens an easy commercial road of communication between the interior and the sea. It would almost seem, that the strata of crystalline schists had been here broken asunder, across their direction, and to their very foundations, by the unusual energy evinced by the upheaving forces in the neighbouring elevation of the highest peaks of the Western Ghaut chain, viz., those of the Nilgherries and Koondahs, and that the shattered sides of this great rift had been swept away, and its aspect modified, by the current of the retiring ocean, above whose waves the granitic and hypogene summits of the Ghauts then first emerged.

The gap is from sixteen to twenty miles broad, narrowing towards its eastern extremity, the surface tolerably flat; and the descent from the plains of Coimbatore and Salem to the Malabar Coast, so gradual as to be almost imperceptible. Its height about the centre, roughly approximated by means of the boiling point of water, I found to be about 970 feet above the sea's level. It is covered with a reddish soil, mostly sandy, imbedding angular, or slightly worn fragments of the granitic and hypogene rocks, from the detritus of which the soil itself is evidently the result. Bare bosses of these rocks, in many places, protrude from the soil. The rocks on both sides are precipitous, greatly modified in external form by that process of exfoliation and splitting into cuboids, to which granitic rocks, and frequently the crystalline schists in contact, are subject.

It has been stated as a well known fact[1], that ships navigating the Malabar Coast during the N.E. monsoon commonly experience a stronger gale in the neighbourhood of Paniani (a town on the coast nearly opposite the western embouchure of the pass) than elsewhere; and this break in the Ghauts appears to be the cause of this effect.

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[1] Madras Almanac, 1840.

During the S.W. monsoon it exerts a considerable influence on the climate of Coimbatore; particularly on that of places immediately east of it, or in a line with its longitudinal axis, by admitting, as through a funnel, and concentrating the full force of the strong westerly winds on the tracts within its focus. Its influence on climate in this respect is felt even farther east than Trichinopoly. At places situate centrically like Bellary between the Ghauts, the force of the monsoons is but slightly felt, from the protection afforded by these great natural barriers.

The influence exerted by the geological features of the regions of India not only over the climate, but over the commerce, government, the moral, social, and physical character of its singular and widely varying population, is in itself a study fraught with the deepest interest, and affords an ample and rich field, hitherto almost untrodden, to the research of the philosopher, and man of inquiry.

It may not be irrelevant to remark, in order to show more clearly the relative geographical position (in a physical sense) of the tract under description, that the whole of the vast continent of India, embraced by the Ganges, the Indus, and the Ocean, may be classed under four great physical divisions, independent of the climatic zones of altitude peculiar to each.

The first is that of *Himálaya*, and its subordinate chains, characterized by a general line of elevation running nearly W. 26° N., and a drainage flowing southerly and easterly into the Bay of Bengal.

The second, that of *Vindhya*, or Central India, with its low plains traversed by the Palamow and Vindhyan ranges, whose general direction is W. 5° S., with a drainage running in a similar direction to the Indian Ocean. This system of elevation serves to determine the drainage of the Himalaya to the east, and that of the plains intervening between its own constituent ranges to the west, from their otherwise natural southerly course.

The third is that of the *Ghauts*, or Southern India, already described, with a line of elevation N. 5° W., and a drainage running easterly and southerly to the Bay of Bengal.

The fourth and last is that of the Indus, flanking those of *Himálaya* and *Vindhya;* the great lines of drainage run S. by W. into the Indian Ocean, from the southern slopes of the *Hindoo Kosh*, whose course appears to be westerly[1].

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[1] A fifth might be added, viz., that of *Maláya*, or Ultra-Gangetic India, comprising the Malacca peninsula, part of Siam, and Birma. This immense line of elevation, extending from the foot of the Himalaya system to the verge of the Equator, has a direction almost parallel to that of Southern India, with which it

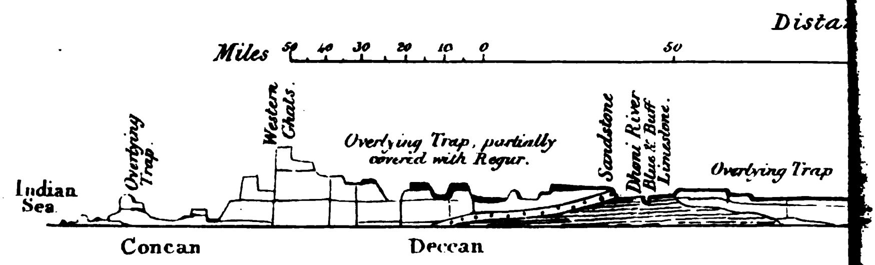
The above classification is susceptible of a number of subdivisions; many exceptions exist, chiefly arising from local physical causes, but the limits of this paper will not admit of my noticing them here.

I shall now proceed to attempt a sketch of the geology of Southern India, as far as hitherto known, commencing with the inferior stratified, or hypogene rocks, following the ascending order. The plutonic and trappean rocks I have found it convenient to describe in the concluding portion of this paper.

SUMMARY. PART I.

THE geology of Southern India will probably have little interest to the mere studier of organic remains, from the extremely limited extent of its known fossiliferous strata; yet the bare extensive surfaces of the granitic, trappean, and hypogene rocks, afford, on a grand scale, exposés, not to be surpassed in any other portion of the globe, of the protean aspects under which these rocks present themselves. The very absence of those fossiliferous beds which so thickly encrust the surface of a great portion of Europe, and many other parts of the world, is in itself a subject of interesting research; and the geological anatomist of the earth's skeleton may, in the peninsula of India, advantageously study a huge and disjointed mass of the nether-formed rocks which constitute the framework of our planet, and which here present themselves almost divested of integument, weathering under the alternations of a vertical sun, and the deluging rains of the tropics. Commencing with these rocks, I shall ascend to those more recently formed, in regular succession.

may possibly be found identical (in epoch.) On its northern portions the drainage is determined southerly by the great westerly elevation of the *Himálaya;* and entering the longitudinal valleys of the *Maláya* system passes southerly along their course to the Indian Ocean. The anticlinal ridge of the chain that runs down the interior of the Malayan peninsula throws off its drainage to the east and west into the seas of China, India, and the Straits of Malacca. The granitic rocks that constitute a great portion of this ridge are remarkably distinguished, mineralogically, from those of Southern India by their highly stanniferous character.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Western Ghats.
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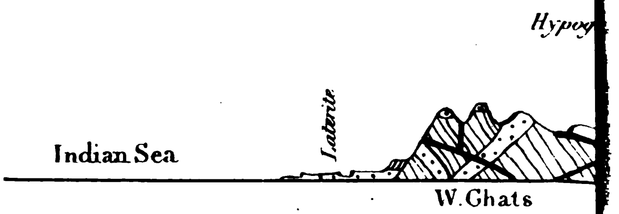
Sandstone
Dhoni River
Blue & Buff Limestone.
Overlying Trap
Concan
Deccan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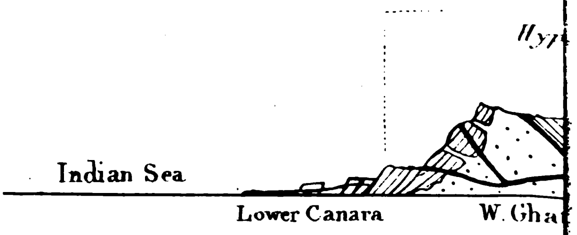
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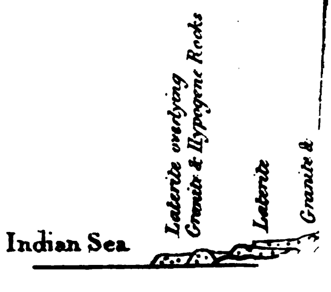

Laterite overlying Granite & Hypogene Rocks
Laterite
Granite &
Indian Sea

HYPOGENE SERIES.

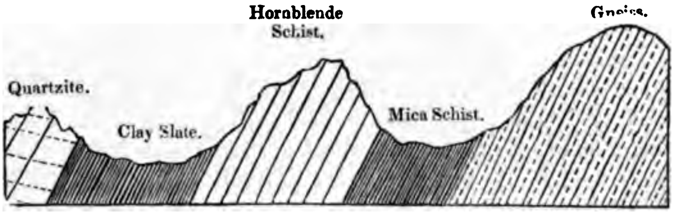
Extent.—Hypogene schists, penetrated and broken up by prodigious outbursts of plutonic and trappean rocks, occupy by far the greater portion of the superficies of Southern India. They constitute the great bulk of the Western Ghauts, from between the latitudes of 16° and 17° N. to Cape Comorin; and from the base of the Eastern Ghauts, from beyond the north limit of our area, to their deflection at Naggery, Lat. N. 13° 20′. They are partially capped and fringed, in the Western Ghauts, by laterite; and in the Eastern Ghauts, by sandstone, limestone, and laterite.

From Naggery to Cape Comorin, they form, with a few exceptions to be adverted to in due order, the basis of the plains of the Carnatic, Arcot, the Valley of Seringapatam, Salem, Trichinopoly, Coimbatore, Tanjore, Madura, Tinnevelly, and Travancore; and, intimately associated with granite, the principal hills and ranges on the low lands south of the Salem break and valley of the Cauvery. North of this valley, and above the break, they form the basis of the table lands of Mysore, the Baramahal, Bellary district, part of Hydrabad, and the Southern Mahratta country; and present a groundwork on which will be sketched out, as accurately as the present imperfect state of information will permit, the circumscribed areas occupied by more recent aqueous strata. Toward the north-west flank of our area, almost in a line drawn diagonally across the peninsula from Nagpore by Bijapore to the western coast, the hypogene and plutonic rocks disappear, emerging only occasionally, under one of the largest continuous sheets of trap in the world, and which extends far beyond our limits to Central India.

Physical aspect of Hypogene area.—The inequalities and undulations observed in the table lands and plains of Southern India, though originating in the dislocations and flexures of the metamorphic strata at the periods of their upheaval, have been evidently modified by aqueous erosion and by the faster weathering of the softer members of the series,—such as mica and talcose schists,—the softer clay slates and shales; which crumbling and washed away, have left their harder brethren standing out in relief on the face of the country.

Where we see gneiss, hornblende schist, and quartzite, rising in parallel ridges separated by valleys, we generally find the valleys occupied by the softer members of the series, often deeply covered with debris from the ridges.

The following section was taken from some low ridges on the table land of Mysore near Chinrayapatam.



Where gneiss rises above the general level of the surrounding plain, its elevations may be distinguished from those of granite, which the hills of thick-bedded varieties of gneiss sometimes assimilate, by their greater continuity and uniformity of altitude; their tendency to a smooth dome-shaped outline, and greater freedom from precipices and disrupted masses. Near lines of plutonic disturbance, however, these distinguishing marks are less perceptible.

Elevations of mica and talcose schists obtain, generally, a less altitude than those of hornblende or gneiss; and have a more round-backed and smoother contour on the whole; yet the outline in detail is jagged, owing partly to these rocks weathering in larger, more angular, or less concentric fragments; often leaving abrupt steps, and small precipices. Hornblende and gneiss are seen rising in the Western Ghauts, in the Nilgherries, to the height of 8000 feet above the sea's level. The former is recognised by its bold sharp ridges, often precipitous, but rarely presenting conical peaks.

Hills composed entirely of actinolite, or chlorite, schist are seldom met with: those of quartzite have long crest-like outlines, often running smoothly for some distance, but almost invariably breaking up into large, angular masses, sometimes cuboidal: the sides of the crests are usually precipitous. Hills of clay slate are distinguished by a smooth, wavy, outline, separated by gently sloping valleys. Outliers, or detached hills, of this rock are usually mammiform. But, as before remarked, all these normal crystalline rocks, when near lines or foci of plutonic disturbance, frequently undergo great changes in physiognomical aspect; and in lieu of the smoothly rounded hills of clay slate, and its gently sloping vales smiling with fertility, we behold it cleaved into sterile, rugged ravines, and rocky precipices.

Order of Stratification.—Gneiss is usually found lowest in the series: next to it mica and hornblende schist, actinolite, chlorite, talcose and argillaceous schist, and crystalline limestone, in due succession: but to this rule there are numerous exceptions. I have observed all these rocks, except crystalline limestone, resting on granite without the usually intervening gneiss. Why these beds, termed metamorphic from the supposition of their having been deposited from water, and crystallized by the influence of plutonic heat, should not have all been similarly altered is difficult to explain, unless it is supposed that their mineral composition differed originally, and that various degrees and durations of heat will produce different effects upon the crystallization and mineral arrangement of the mass acted upon.

Dip and Direction.—The strata are often violently contorted, or bent in waving flexures, particularly in the vicinity of plutonic rocks; and much irregularity occurs in the amount and direction of dip throughout the hypogene area. In the Western Ghauts it is usually easterly, and at angles varying from 10° to 90°. In the Udigherry portion of the Eastern Ghauts and in the plain at their eastern base I found the dip often westerly, and varying as above from 10° to 90°.

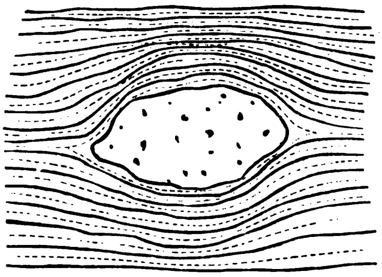
The dip in the plains south of the Salem dislocation, and in the gap of Paulghautcherry, is for the most part to the S.S.E. at angles from 30° to 80°. In the low lands at the west base of the Western Ghauts at Honawer, it was easterly at an angle of 30°; a little further, S.S.W. At the summit of the Ghauts near the falls of Gairsippa, the gneiss dipped at an angle of 35° to the N.E.

On the table lands the dip also varies much in intensity and direction: among the Kupputgode hills, in the South Mahratta country, it was in one situation quaquaversal; and Benza observed the hornblende schists at the east and west bases of the Nilgherries dipping anticlinally from the axis of elevation; but they do not always dip from the plutonic rocks—in many instances the dip is towards them: a fact, indicating that the strata have been disturbed at some previous period, or that they may have suffered inversion; which is known to be the case in beds of more recent origin. While the dip of the two great lines of elevation, viz., the East and West Ghauts, is generally westerly, and easterly, or at right angles with the direction of the strata, that of the minor cross ranges is usually southerly. Numerous irregularities and exceptions, however, to this general rule occur, particularly near the northerly and southerly great synclinal line of dip on the table lands between the Eastern and Western Ghauts, and near localities where it is traversed by the cross lines of elevation. The intrusion of trap dykes has also caused much diversity in the dip. These irregularities will always prove obstacles in tracing out with accuracy the synclinal dip line between the Eastern and Western Ghauts.

Joints and Cleavage.—The jointed structure is most observable in the thick-bedded variety of gneiss, the hornblende schist, and quartzite; in the two latter it is often so strong as to deceive some observers, who have taken the joint planes for the lines of stratification, which they cross usually at right angles, or nearly so. The planes of cleavage are most distinct in the chlorite and clay slates; they are sometimes parallel with the joints, but more frequently with the lines of stratification, which are often remarkably indistinct in the clay slates.

Lithologic Character.—Gneiss and hornblende schist are by far the most prevalent rocks of the series: to gneiss the other members may be termed subordinate. Near its contact with the granite it commonly assumes the character of, what has been styled by Boué, granitoidal gneiss, losing its stratified appearance, and not to be distinguished in hand specimens from granite. Spherical and oval masses of granite, resembling boulders, are sometimes observed impacted in the gneiss.

The following is a sketch of one of these bodies imbedded in the gneiss of the Western Ghauts, in the Paulghautcherry Pass near Vaniencolam.



These have certainly more the appearance of imbedded boulders of granite, than the concretions we see in the sandstones of Europe: while others again assimilate the globular forms produced by heat in regularly sheeted trap rocks. Veins of reddish compact felspar, felspar coloured green with actinolite, epidote or chlorite, with, and without, quartz; also of milky quartz with nests of iron ore, mica and hornblende, are very common in gneiss: also dykes and veins of granite. All these veins are of older date than the intrusion of the greenstone dykes which invariably sever them. Particular varieties of gneiss prevail in different districts. Protogenic gneiss, viz., gneiss where the mica is replaced by talc, is found in the western parts of

Mysore; albitic gneiss, in the Eastern Ghauts above Beswara. Garnets are universally distributed: but in the greatest abundance in the gneiss of the Eastern Ghauts. The gneiss of the Eastern Ghauts is also lithologically distinguished from that of the Western Ghauts by its less auriferous and more cupriferous character, and by its assuming, in many places north of the Kistna to Ganjam, so arenaceous a texture and colour as hardly to be distinguished from sandstone in hand specimens; and where capped by true sandstone, it is difficult to say where the gneiss ends or the sandstone begins. The mica and felspar are replaced by quartz and minute garnets, coloured and loosely agglutinated by peroxide of iron. The felspar is often aggregated in veins, decomposing into a white clay. It is a fact worth remarking, that the gneiss in contact with granite almost invariably assimilates the latter in mineral character. The grand characteristic of these rocks, however, on the Indian peninsula is their highly ferriferous nature, which remarkably distinguishes them from the stanniferous hypogenic and granite rocks of the sister peninsula of Malacca, which has an almost parallel direction and is separated only by the Bay of Bengal. In Southern India these rocks not only abound in nests and veins of rich magnetic and oxidulated iron ore, but in thick interstratified beds and mountain masses of these minerals, while not a grain of tin ore has hitherto been discovered.

Mica Schist.—Mica schist is found sparingly distributed over the whole of the hypogene area in thin beds. It is found in the greatest abundance and purity in the western parts of Mysore. I do not remember ever having seen in it a vein of granite, though abounding in those of quartz. Talcose, chloritic, and actinolitic schists are still more sparingly distributed: the first is seen in the western parts of Mysore; near Salem, in the valley of Cauvery; and in the Eastern Ghauts, in beds of some thickness; as also chlorite slate. Fine varieties of actinolitic schist occur in the Western Ghauts at the falls of Gairsippa; near Palliconda, and Suntghur in the Carnatic; and it is pretty generally distributed in thin beds over the Bellary districts, Mysore, and in the western and southern portions of the Nizam's territories.

Hornblende Schist ranks next to gneiss in extent and thickness of beds, and is seen washed by the sea at the bases of the Eastern and Western Ghauts, forming some of the loftiest peaks of the latter, and supporting large level tracts of table land. This rock varies from the compact structure of basalt to the crystalline texture of granite, and to that of porphyry, and may be seen from laminæ of a few lines in thickness, passing into beds forming mountain masses. The principal constituent minerals of this rock, for which so many different names have been applied by geologists according to the preponderance of one or the other, its laminar, or thick-bedded structure, degree of crystallization, &c., are hornblende and felspar. Quartz, garnet, and mica are frequently mixed. Near the junction with granite I have observed, in some situations, the hornblende rock appear to pass, like gneiss, into granite by insensible gradations: the change in this instance is the more striking, as the hornblende rock not only loses its bedded structure, but, on account of its darker colour, the change in its mineral arrangement is more perceptible than in the gneiss: the hornblende and felspar gradually separating, assume the granular and crystalline structure of granite, the resemblance still increased by the appearance of a few scales of mica. The granite, in its turn, often becomes hornblendic. It must not be forgotten, however, that, in most instances, when these rocks come in contact, the line of demarcation is tolerably distinct. The occasional passage of this rock into granite will serve to distinguish it from the greenstone of the dykes in granite, and in the hypogene strata, with which it has been confounded; the latter rock, though sometimes slightly blended at the contact, I have never witnessed passing insensibly one into the other. The needle-striped crystals of augite observable in the basaltic greenstone of the dykes, its generally more compact and homogeneous structure, and greater freedom from quartz and felspar in a separate state, may serve as empiric distinctions between the two.

Large beds of compact felspar, generally of a pinkish hue, with a little quartz, and a few scales of mica, quartzite,—the Arkose of Brongniart,—and milk quartz, having a similar direction to that of gneiss, &c., occur forming low ranges of hills. Interstratified garnet rock is met with at the base of the Eastern Ghauts, in the Nilgherries, and at Senklidroog in Salem.

Hypogene limestone (marble) is of such rare occurrence as to have entirely escaped the notice of most geologists who have written on this part of India. Captain Macpherson[1] mentions a "primary limestone" laminated by argillaceous matter in the neighbourhood of Nundigamah near Bezwarah, in the Eastern Ghauts, but was unable to ascertain its exact situs. Calder[2] states its occurrence in the Tinnevelly district near Courtallum; and I have seen it, in extremely thin layers, in the hornblende schist of Dummul, of the South Mahratta country, and in that of the Copper Mountain range at Bellary, and also in the garnitic gneiss of Senklidroog and Karpur (Salem district). The deficiency of this member of the metamorphic series, so largely developed in the Alps, is almost equally remarkable in the hypogene rocks of the Grampians, and in those of Norway and Sweden. It exists, doubtless, in Southern India in more localities than those just specified, but in such paucity as forcibly to exemplify the truth of Mr. Lyell's remark, viz., "that the quantity of calcareous matter in metamorphic strata, or, indeed, in the hypogene formations generally, is far less than in fossiliferous deposits." Why this should be so has been attempted to be explained by the theory of the non-existence of those mollusca and zoophytes by which shells and corals are secreted, at the period when the hypogene rocks were deposited. Others, again, are of opinion, that when these strata were broken up by the grand outbreak of plutonic rocks, the same heat which imparted to them their present highly crystalline texture, expelled from them the lime and carbonic acid. Neither of these theories, taken individually, appears to be satisfactory. It seems more reasonable to suppose that, during the earliest phases of the history of our planet, when the hypogene rocks were deposited, lime was far less abundant on its surface than at present; for although it has not been proved that lime-secreting molluscs and zoophytes did not exist in the ancient waters from which the metamorphic schists were deposited, yet it seems proved, from their scarcity in the lower rocks, that they must have existed in far less numbers than at subsequent periods.

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[1] Asiatic Researches, Vol. XVIII., Part II., page 18.

[2] Ibid., Part II., page 8.

The other, and principal source from which the lime on the earth's crust has been derived, is springs of water charged with carbonate of lime brought up from beneath its surface. If we assume that the greatest quantity of lime is brought up from calcareous rocks in the interior of the earth, when fused or heated, during periods of plutonic activity, as would seem to be the case by springs of water charged with this mineral abounding in volcanic districts, it will be readily admitted, that but little lime was deposited during the period of repose in which the hypogene strata were accumulating under the ocean; and that a large development of it took place, when by far the greater bulk of these beds were broken up and uplifted. At all events, there can be no question that the deposit of lime brought up from the earth's interior by springs, many still in operation, must be greater now, than when it commenced at a remote geological era.

Clay-slate.—Clay-slate does not occupy a large surface of the hypogene area. Its principal localities are in the Nellore and Guntoor copper district; around Darwar; in the Ceded Districts, near Bellary and Sondoor; in the south-west portions of the Nizam's country, at Idlapur and Cundagal. It is generally associated in conformable strata with beds of chlorite and hornblende schists, also of quartzite and siliceous schists. Blue roofing slate is rare. The siliceous schists of Sondoor, Darwar, Ceded Districts, &c., often pass into a striped jasper, and may be classed under M'Culloch's second division of schist, viz.:—

"F. Laminar, with alternate colours, and forming some varieties of the striped jasper of mineralogists. The colours are commonly shades of red, brown, yellow, and purplish black, and these kinds appear to be derived from the coloured shales.

"G. Containing imbedded crystals of quartz, and of a porphyritic aspect."

This rock is usually seen cresting hills of chlorite, hornblende, or clay-slate, regularly interstratified. At other times the stratification is obscure; the structure, usually laminar, sometimes puts on the aspect of a breccia that has the appearance of the laminar variety having been broken up, and re-cemented *in sitû* by a dark brown ferruginous paste. The rock is often highly ferruginous, and composed of alternate layers of magnetic iron ore with polarity, and grey, or brownish-grey chert. Basanite occurs associated with the hornblende, chlorite, and clay-slates.

It would be endless here to enumerate the various aspects under which the hypogene rocks present themselves dependent on mineralogical differences. The numerous divisions into which M'Culloch has petrologically classed them may be all observed in an area of a few miles' extent. Their mineral character has, however, been minutely described in my more detailed geological notes published in the Journals of the Bengal and Madras Asiatic Societies.

Imbedded Minerals in the Hypogene Rocks: Earthy Minerals—Silica.—Fine crystals of quartz are found at Vellum, near Tanjore. Chert is pretty generally distributed, also the common garnet; the latter occurs in the greatest abundance in the Eastern Ghauts, the Copper Districts of Nellore and Guntoor, Salem, the Nilgherries, and in the Western Ghauts below Goa. Mines of the precious garnet, almandine, have been excavated by the natives at Gharibpett near Palunshah in the Nizam's territories. Pyrope is said to be found in the central parts of the Peninsula: green garnet occurs in the gneiss of Senklidroog, in the Salem District[1]; dodecahedral garnet, assimilating essonite or cinnamon stone, in the hornblende schist of the Nilgherries[1]; and black garnet, and tremolite in the granitoidal gneiss of Peroor and Wurralconda (Mysore). Epidote and actinolite are found usually in quartz and felspar veins. Hypersthene is occasionally seen in the hornblende schist of the Ceded Districts. Indianite occurs sparingly with corundum, fibrolite, and garnet in gneiss and hornblende schist in the valley of the Cauvery.

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[1] Benza, Madras Journal of Literature and Science, Vol. IV., pages 266, 267.

Earthy Minerals: Alumina—Corundum.—Bournon considered indianite and fibrolite to be the matrix of corundum in Southern India; and Phillips states, on what authority is not mentioned, that its gangue in the Carnatic is a coarse-grained white marble. I have always found it, both in Mysore and Salem, in talc, mica, or hornblende schist, associated with iron ore, asbestus, and sometimes indianite and fibrolite. It occurs imbedded in the rock in grains and crystals. Viralimodos and Sholasigamany are its principal localities in the valley of the Cauvery; Golashully and Kulkairy in Mysore, where it also occurs at Mundurim[2], near Seringapatam, Tippaty, Beygoor, Bannercota, Baugoopilly, and other places. It is also said to be found in the hypogene schists of Nellore and Guntoor. The spinel ruby (dodecahedral corundum), and sapphire (the corindon hyalin of Haüy), are occasionally found with the common corundum in the Salem district, and in the valley of the Cauvery. Emery, or granular corundum, is found at Bombardipádu[3], about twenty-four miles northerly from Tripaty in North Arcot, in hornblende rock, in pieces varying from the size of a pea to that of a hen's egg, or even larger. Common corundum is also found where the Godavery escapes though the Eastern Ghauts, east of Papconda, from the Nizam's territories to the plains of Rajahmundry and the sea. Beryl occurs at Paddioor in Coimbatore; and, according to the natives, at Vaniambadi, at the north base of the Nilgherries.

Fibrolite occurs but rarely with indianite and corundum, as has been before alluded to, in speaking of the last two minerals. Kyanite I found associated with adularia, asbestiform tremolite, and magnetic iron ore, at Adipuram; in the Nellore district, in gneiss: it occurs in the same rock near Gharibpett[4], in the Nizam's territories; also in Mysore[5], and in the maritime districts of the Godavery and Kistna[6], with tremolite, pearl spar, bitter spar, almandine and staurolite. The last-mentioned mineral occurs in the hypogene and platonic rocks north of Ryacota, in the Baramahal, associated with hornblende, felspar, and epidote[1].

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[1] Macgregor, Madras Quarterly Medical Journal, July, 1842, page 284.

[2] Clarke, Madras Journal, January, 1839, page 121.

[3] Hayne's Tracts, page 110.

[4] Voysey.

[5] Clarke, Madras Journal of Literature and Science for January, 1839, p. 120.

[6] Macpherson, Asiatic Researches, Vol. XVIII., page 120.

Earthy Minerals: Magnesia.—Steatite occurs in the talcose schists in the western parts of Mysore; as also potstone, in beds of considerable size, and veins, and more or less dispersed over the whole hypogene area; occasionally associated with nephrite.

Alkalino-Earthy Minerals: Potash.—Mica is found universally diffused. In some parts of the Western Ghauts, and on the table lands to the east, this mineral and talc are found in plates large enough for windows, and lanterns; for which purpose they are used, as also for ornamental devices, and for painting on, by the natives of India. Chlorite is rarely found uncombined with felspar, silex, or hornblende. Nacrite, or scaly talc, is here and there met with. Adularia is found in the gneiss at Adipuram, in the Nellore district, and other places.

Alkalino-Earthy Minerals: Soda.—Albite, or cleavlandite, occurs pretty abundantly in the gneiss of the Eastern Ghauts above Bezwara, north of the Kistna, at Paddioor in Coimbatore, and occasionally throughout the gneiss districts of Southern India: as also tourmaline, or schorl, both black and green.

Acidiferous Earthy Minerals: Alumina and Lime.—Sulphate and sub-sulphate of alumina are occasionally found in thin incrustations and efflorescences between the layers of the soft ferruginous slates into which the hornblende and mica schists pass; for instance, in the Copper Mountain range near Bellary, where I have also observed calcareous spar in nests in the gneiss and hornblende schist. General Cullen has found calcareous spar in the gneiss of Travancore. This mineral is of rare occurrence in the hypogene rocks of Southern India. Bitter spar is said to occur[2] in the maritime districts of the Kistna and Godavery.

Acidiferous Earthy Minerals: Magnesia.—Magnesite, an almost pure carbonate of magnesia, occurs in beds, veins, and nests in the hornblende and talcose schists near Salem, associated with rocks analogous to serpentine, or chromiferous ophiolite, asbestus, chert, a silicate of magnesia, nephrite, and chromate of iron: also at Yedichicolum, and other places on the banks of the Cauvery; and in the vicinity of Hoonsoor in Mysore. In geological situs, and age, the magnesite of Southern India assimilates the older magnesites of Styria, Moravia, Baltimore, and Turin.

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[1] Hayne's Tracts, page 345.

Macpherson, Asiatic Researches, Vol. XVIII., p. 120.

Metalliferous Minerals: Iron.—Iron pyrites, or sulphuret of iron, is distributed in small proportions in the hypogene rocks; but the oxides, both magnetic and hæmatitic, exist in extraordinary abundance, forming masses and large interstratified beds in mountain chains. In gneiss these ores frequently replace hornblende and mica; alternating with quartz in regular layers. Magnetic iron ore with polarity is found at Pakanandoo, in the Salem district, in beautiful octohedral crystals. It occurs in the massive state on the Baba Booden hills in Mysore, those of Kittoor and Darwar in the Southern Mahratta country; in large masses among the hills of Sondoor near Hospett, and in many other localities.

Micaceous and specular iron ore are less common. A dark magnetic iron sand is usually found, in the beds of streams having their origin among hypogene rocks, associated with gold dust; and sometime with menaccanite.

Titanium.—Iron ore slightly titaniferous is found over the whole hypogene area. Menaccanite I found among the iron sand, and gold dust in the best of the Doni rivulet among the Kupputgode hills, and in some of the rivulets of the Ceded Districts.

Manganese.—The black oxide of manganese, associated with iron ore, is found in considerable quantities among the Kupputgode hills, and more sparingly in those of the Ceded Districts, Mysore, and the Nilgherries.

Chrome.—Chromate of iron occurs associated with the magnesite of Salem, and probably exists in other magnesite localities.

Copper.—Ores of copper, principally the green carbonate and sulphuret, occur in strings, nests, nodules, and short broken veins in the gneiss, mica, and hornblende schists of the Nellore and Guntoor districts. The carbonate is also found among the Kupputgode hills, in the Copper Mountain near Bellary; and in various localities in the Eastern Ghauts. The rarity of a regularly continuous lode of ore in the rocks of India is a remarkable peculiarity, and has hitherto discouraged the exertions of miners. However, our knowledge is confined to veins near the surface: and I do not consider that up to the present a fair trial has been made of their mineral resources.

Silver.—Ores of silver are said to occur in Madura, and also in Mysore[1]. I found a single fragment of the grey carbonate in the auriferous sands of the Doni rivulet in the Kupputgode hills. The rocks in all these localities are hypogene and plutonic. In the Doni rivulet the sand contained magnetic iron sand, menaccanite, carbonate of copper, and a grain or two of a white metal, soluble only in nitro-muriatic acid,—probably platinum. Two bits of metallic silver and copper were also found in the sand here, which from not being *in situ*, and the possibility of their being adventitious, cannot be safely pronounced as native.

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[1] Clarke, Madras Journal of Literature and Science for January, 1839, p. 120.

Antimony.—This mineral is said by Dr. Clarke[1] to occur in the Baba Booden hills of Mysore. What is generally sold as surmeh, or antimony, in the bazaars of Southern India, and used largely as a collyrium by the natives to improve the brilliancy of the eye, I have fund to be a micaceous iron ore. Galena, or sulphuret of lead, is said to be also substituted.

Combustible Minerals: Graphite.—Graphite I found in thin shales in the gneiss of the south-west part of the Nizam's dominions at Nundapur.

Many minerals common in the hypogene series of Europe have not yet been noticed in this class of rocks in Southern India; such as fluor spar, barytes, strontianite, apatite, chiastolite, pyenite, andalusite, antomolite, and a number of other minerals less frequent.

Zircon is said to occur in the alluvium at Ellora, and cats'-eye in that of the Kistna, and of the rivers in Malabar; and umber in the Nilgherries. I have little doubt that the labours of future mineralogists will add greatly to this list of minerals associated with the hypogene formation of Southern India.

In concluding this summary of the metamorphic rocks of Southern India, I cannot refrain from remarking how forcibly they recall to mind the remark of the illustrious Humboldt, who, in concluding his survey of the plutonic and hypogene series of South America, says: "When we pass to another hemisphere, we see new forms of animals and plants, and even new constellations in the heavens; but in the rocks we still recognise our old acquaintances; the same granite, the same gneiss, the same micaceous schist, quartz rocks, &c."

PART II.

DIAMOND SANDSTONE, AND LIMESTONE.

RESTING immediately on the hypogene and plutonic rocks are found beds of limestone, sandstone, and sandstone-conglomerate (the latter often imbedding diamonds)—argillaceous, arenaceous, and siliceous schists, which, from their being usually associated, sometimes alternating, and their frequent conformability of strata, it has been thought convenient, until the discovery of distinguishing fossils, to describe under one head.

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[1] Clarke, Madras Journal of Literature and Science for January, 1839, p. 120.

Geographical extent and position.—Next to the hypogene schists, just described, and the associated plutonic rocks, these limestone and sandstone beds occupy, perhaps, the greater portion of our area north of a line drawn from Pulicat to Mangalore on the south, and the southern edge of the great overlying trap formation on the north. In the south of India, from Cape Comorin to the Salem Break, they have not hitherto been seen; and, what is remarkable, they appear almost wholly confined to the elevated table lands, and to the Eastern Ghauts, which they cap at intervals from Naggery to beyond the northern limit into Cuttack. Below the escarpment of the Western Ghauts the sandstone has only been observed at Atchera[1], on the Malabar coast.

Dipping at a considerable angle to the north-west, the limestone has not hitherto been seen either on the maritime plains below the Eastern Ghauts, or in those of the Western Ghauts. On the table-lands these works are most frequently observed, exposed in the vicinity of the great drainage lines of the country—for instance, those of the Godavery, Bhima, Kistna and Gutpurba, Malpurba, and Pennaur. They occur in irregularly-shaped patches, separated usually by broad and apparently denuded zones of the subjacent hypogene and plutonic rocks.

Physical aspect.—The tracts occupied by the limestone and sandstone beds present a diversified aspect, sometimes flat and monotonous, and at others, near lines of plutonic disturbance, bare, rugged, and picturesque. The limestone in some situations has evidently been denuded of the usually superjacent sandstone, dislocated, and elevated several hundreds of feet above the general level of the surrounding country in regular ranges, and often in highly-inclined strata, as in the tract between Banaganpilly and Gooty. Caps of sandstone, though in such cases often wanting, are sometimes seen still covering the limestone peaks. The outline of these limestone ranges usually presents long, flattish-topped ridges, whose sides and summits are not unfrequently covered with detached angular blocks of the rock, with a grey, weathered, and scabrous exterior, resembling that of the mountain limestones of Europe.

The sandstone, where undisturbed by plutonic intrusion, occurs in low, flat, wall-like ranges, rising at an almost similar level, rarely exceeding 500 feet from the surface of the surrounding country, supporting table lands of some extent, and evidently once continuous. It is often intersected by deep fissures, extending from the summit of the rocks down to the base. These sometimes run through and divide entire hilly chains, in a direction at right angles to their course, and not unfrequently afford outlets to the streams that cross the Peninsula from west to east on their passage to the Bay of Bengal. The direction of the fissures is sometimes zig-zag, as in the remarkable gap of Ganjicotta on the table land of the Ceded Districts, through which the Pennaur flows, washing the bases of the precipitous and picturesque cliffs that form its sides. In some instances these great cracks in the sandstone have been widened and altered by the force of the streams that find a vent through them.

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[1] Malcolmson, Geological Transactions, Vol. V., page 367, Second Series, Part III.

When disturbed by plutonic force, the sandstone exhibits a striking contrast in its outline to the tame horizontal aspect it assumes at distance from the axes of disturbance. It rises in bold relief against the sky in lofty rugged cross, or hog-backed and crested hills, with precipitous mural ridges, which, rarely running at the same level for any distance, are interrupted by portions of the same ridge thrown up at various angles with the horizon in steep and often inaccessible cliffs. These features are more strikingly seen in the ranges east of Gooty, on the edge of the granitic rocks, and in the Eastern Ghauts in the vicinity of Naggery, Udigherry, and in some parts of Goomsur. When it crests the hypogene rocks, the lower part of the elevation is often composed of the latter to the height of about 200 to 400 feet, the slope of which has usually an inclination of from 15° to 20°, while that of the cap of sandstone presents a steep or precipitous declivity varying from 45° to 90°, giving a decided character to the aspect and configuration of the mountains and ranges thus formed.

The hills of arenaceous schists are to be recognised from the more massive sandstones by their undulating, round-backed summits, and their buttressed and dimpled flanks; while those of the softer slates and shales affect the mammiform outline.

Both limestone and sandstone beds there is little doubt were formerly of greater extent than now, and owe much of their present discontinuity and scattered positions to the agency of plutonic disturbance, and subsequent denudation. The tracts of country intervening between their areas are usually occupied by granitic and hypogene rocks. The superincumbent beds, broken up by the granite rising to the surface, have been more easily carried away by aqueous currents, than in undisturbed situations, where we find their continuity greater. To admit this, it will be necessary to adopt the theory of the granite's rising above the surface in a solid, or a nearly solid, state. It is a fact, that in granitic tracts the denudation has been most complete.

I shall now proceed to notice, in detail, the extent, &c., of the various detached portions, or patches, of the limestone and sandstone strata.

Cuddapah Beds.—The Cuddapah beds appear to be the most extensive, occupying an area of about 9000 square miles, comprised between the 13th and the 17th degrees of north latitude. They extend east and west from the Eastern Ghauts over the table land of the Ceded Districts, to the village of Yaripilly, about nine miles east of the fortress of Gooty, and to Peddapa. On the north they stretch from the left bank of the Kistna, near Waripilly, covering the eastern and central portions of the Eastern Ghauts to Naggery, the adjacent table lands of Cuddapah, Kurnool, Tripetty, and part of North Arcot, to the north frontier of Mysore, near Rayachooty. It meets the hypogene and plutonic rocks of Hyderabad near Myapoor, a village on the left bank of the Kistna, about nineteen miles northerly from the city of Kurnool.

Godavery Beds.—A number of small outlying patches stud the plains between the Kistna and the Godavery; and the sandstone is seen at intervals capping the Eastern Ghauts, and forming low ranges stretching into Cuttack beyond our limits.. Near the diamond mines of Condapilly, on the north bank of the Kistna, it appears to touch the Cuddapah beds, which are seen in the channel of the Kistna at Amráwati. Further inland, on the north-east extremity of the tract under description, another patch extends in a south-eastern direction on the banks of the Godavery, commencing to the north-west of its confluence with the Banigunga, and traceable to the hot springs of Budrachelum, on the south-east[1]. Others occur at intervals on the banks of the Godavery at various distances to the alluvial plains of Rajahmundry near its embouchure.

South Mahratta Country Beds.—Separated by a zone of outcropping hypogene and plutonic rocks, about a degree and half in breadth, from the Cuddapah beds, and immediately to the westward of them, lie those of the South Mahratta country, extending north and south from the vicinity of Chimlughi, near the confluence of the Kistna and the Gutpurba, to Gujunderghur on the south, and from Moodgul on the east, to the subordinate chains of the Western Ghauts at Gokauk, and thence stretching down southerly towards Belgaum. The hill-forts of Pedda and Chich Nurgoond, and of Nowlgoond, stand on outliers a little below the southern limit of this patch. The course of the Gutpurba forms an irregular boundary to the north, with the great overlying trap of the Dekhan.

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[1] Malcolmson, Geological Transactions, Vol. V., Second Series, Part III, pp. 567, &c.

Hydrabad Beds.—Smaller isolated patches are observed in the Southern Mahratta country, between it and Hydrabad, viz., at Mudibhal, and Talicota, on the banks of the Bhima, between the city of Gulberga and Firozabad; and also in the vicinity of Digaye, between Muktul and Gulberga.

The sandstone again[1] crops out in the Hydrabad country near Sarapúr, between Hunnumkoondah and Pakkal, to which it continues penetrated by granite.

Beds of limestone occur at Kotah, about ten miles up the Pundeetah river above its confluence with the Godavery.

Identity.—The identity of these scattered beds is proved by their relative geological position with respect to other rocks, their imbedded pebbles, and striking mineralogical resemblance.

Order of Stratification.—The limestone occupies, with few exceptions, the lowest position in the sections afforded by the great lines of drainage of these tracts, and in places where the superincumbent strata have been stripped off.

Next in order of superposition come calcareous shales, mingled with much argillaceous matter, then argillaceous shales and slates, sandstone, siliceous and arenaceous schists, quartz rock and sandstone conglomerates.

In one or two situations I have observed the limestone, where elevated into chains of hills, alternating with sandstone; for instance, between Banaganpilly and Pycut Puspoolah; and near Ryelcherroo in the Cuddapah tract; and also a little south of Kulladghi in the Southern Mahratta tract.

Direction and Dip.—The direction of these beds usually conforms to that of the hypogene schists on which they rest. They have, with the latter, been broken through, penetrated, tilted up, and altered by plutonic rocks. The disturbance is most apparent on the edges of the beds. At a distance from the lines, or *foci* of plutonic action, the beds are found but slightly inclined, and their dip following the easterly and southerly inclination of the great table lands. The Cuddapah strata have been raised at their eastern limits by the elevation of the

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[1] Dr. Walker, Journal of Asiatic Society of Bengal, 1841, No. 30, p. 471.

Eastern Ghauts with the subjacent hypogene schists, to the average elevation of about 2000 feet above the sea's level; dipping about 40° westerly. They have been similarly lifted by plutonic rocks at their western edge, between Ryelcherroo and Gooty, where the dip is 42° easterly. Intermediate between these axes of elevation the strata are but little inclined. In the tongue of land separating the Toombuddra from the Kistna, the dip of the limestone appears to conform to the undulations of the plain; and is in some mammiform elevations, quâquâversal. On the south bank of the Gutpurba, near its confluence with the Kistna, large masses of the light bluish-grey limestone have been thrown on their edges, and the strata inclined at various angles to the horizon. At Kurnool, the ditch of the fort affords a beautiful section, illustrating the little extent to which disturbance is sometimes carried by plutonic forces. The beds of limestone in the vicinity have but a very slight dip, which in the short space of 500 yards, passes into highly inclined, waving, curved, vertical, and anticlinal, having been broken through by a wedge of hypogene rock (hornblende schist) resting on granite.

Dip of the Sandstone Beds.—The dip of the sandstone when resting on the limestone is usually not so great as that of the latter, or, in other words, unconformable. It may be hence inferred that an interval took place between the deposition of the limestone and sandstone strata, during which the former were disturbed and again tilted up after the deposition of the latter. To strengthen this supposition of two epochs of geological disturbance, it may be added that pebbles of chert and jasper, evidently derived from veins in the limestone, are frequently found in the sandstone conglomerates. The sandstone sometimes rests horizontally on the granite and hypogene schists; but in general it conforms almost to the dip of the latter, as seen in many places in the Eastern Ghauts, north of the Kistna, and in Goomsur, where the dip is generally between 60° and 80°, and inclined to every point of the compass.

Cleavage and Joints.—Joints and planes of cleavage are often strikingly developed in the structure of the more schistose and laminar members of the limestone and sandstone rocks. At Nundaloor, in the Cuddapah district, where the strata have an easterly dip of 12°, the cleavage planes formed an angle of 40° with those of deposition, dipping in an almost similar direction, and preserving far greater regularity and uniformity of dip even over extensive tracts. The lines of deposition are here distinctly marked by alternate parallel light and dark-coloured bands. The joints are at right angles, or nearly so, with the planes of stratification, and often filled or lined with calcareous incrustations. Near Kulladghi, the calcareous slates associated with the limestone sometimes possess a true transverse cleavage, dividing the rock into rhomboids capable of indefinite subdivision into similar forms, at angles of from 30° to 40° with the direction of the strata. The joints here intersect the cleavage at right angles. The true surfaces of deposition may be usually distinguished from the smooth rectilinear planes of cleavage, by their peculiar dimpled aspect. This characteristic is, however, often more or less obscure.

Ripple Marks.—On the exposed surfaces of the sandstone cliffs south of Cuddapah, at Ganjicotta in the Ceded Districts, Gokauk in the Southern Mahratta country, among the ranges between the Kistna and Bagulcota, and various other localities, I have observed distinct ripple marks. Their longitudinal axes, though extremely various, have on the large scale a tendency to an E.N.E. direction, showing that the current which caused them flowed generally in a W.N.W. or in an E.S.E. direction. The marks are not confined to strips or zones of the sandstones, like those of ancient beaches, but extend in every direction over considerable spaces, resembling those on sand constantly under water.

Fissures and Caves.—I have already alluded to the fissures which often cleave the sandstone masses from summit to base. These when numerous and crossing each other at right angles, impart a tesselated appearance to the surfaces of the flat-topped hills. The pebbled surfaces of the comglomerates thus divided are often remarkably level, and reminded me of the artificial pebbled floors found among many of the Roman ruins in Italy. In other situations the fissured surfaces resembled those produced by contraction in drying, in the mud of a tank or river, or in the *Regur*, or black cotton soil. In the sandstone their origin may have been similar, during the consolidation of the rock by plutonic heat. Vertical fissures are also seen in the limestone, though by no means to the same extent: they vary from a few lines in width to many yards. Caverns, so common in the limestone formation of Europe, are rarely seen: a few occur in the Cuddapah beds; some of which, as well as the fissures, I have searched in vain for organic remains. They usually contain incrustations of carbonate of lime, stalactite, kankar, detritus, and angular debris of the rocks forming their sides. Both caverns and fissures are frequently the outlets of springs. The sides of the vaults, though often smooth, do not exhibit the polished or grooved surfaces of attrition; nor can we expect to find such in tracts where the strata are undisturbed.

Parallel furrows and grooves, apparently caused by the action of pebbles moved along by water, are occasionally observed on the surface: particularly on the summit of some limestone cliffs between Banaganpilly and Peapilly, in the Ceded Districts. Rock basins above the present drainage level of the country are rare.

PART III.

DIAMOND SANDSTONE, AND LIMESTONE.

Lithologic Character of the Limestone.—The limestone passes from a dark blue, or nearly black rock with a smooth, but somewhat earthy, conchoidal fracture, into one of a more compact texture and of a light buff, or cream colour, adapted for lithographic purposes: for instance, some of the varieties near Bagulcota, and Talicota in the Southern Mahratta country; near Kurnool and Ryelcherroo in the Ceded Districts; and Datchopilly in the Nizam's territories. The specimens of these lithographic limestones that have been subjected to actual experiment, though found occasionally to answer, have proved inferior to those of Germany; being often penetrated by minute threads of silex, or calc spar, and not of a sufficiently homogeneous texture. It must be remarked, at the same time, that these localities have not been explored and quarried with adequate care or labour for better specimens, which, it is probable, the lower beds may yield. In structure the limestone is both thick-bedded, and laminar; in colour it is generally of a light bluish grey, though, sometimes, as just observed, nearly black, passing into a variety of beautiful and lively shades of green, yellow, pink, and white; sometimes irregularly disposed, but more frequently in alternating bands, coinciding with the lines of stratification. The green varieties are often spotted with a darker green, or bluish black, assimilating in colour some varieties of serpentine. This latter mineral sometimes occurs in thin strings and nodules in the limestone, and evidently imparts to it much of its colouring matter. These nodules in the vicinity of Kurnool and Ryelcherroo, are usually of a light or siskin green colour, translucent and sectile; streak nearly white. Before the blowpipe they become opaque, redden slightly, and fuse partially on their edges into a white enamel. The variety of limestone imbedding them is often magnesian, and contains asbestus; although the general character of the beds is siliceous and argillaceous, as is evident from the following analysis of an average specimen of the Cuddapah dark blue limestone made for me by my friend Mr. Macleod, Inspector-General of Hospitals, Madras.

Silex	12	5
Alumina	2	5
Oxide of iron	1	3
Carbonate of lime	33	3
Loss	0	4
	50	0

The chief object of this analysis was to ascertain the origin of the dark colour of this limestone; since, from its whitening before the blowpipe, I had long thought it could not be ascribable to protoxide of iron: the analysis has proved the truth of the conjecture. Mr. Macleod is of opinion that it owes its colour to volatile matter; "extractive." The limestone, in the vicinity of basaltic, plutonic, and hypogene rocks, is usually siliceous, and presents veins of chert, red and brown jasper; sometimes intermingled with films and nests of a mammillary chert, resembling calcedony; and calc spar, as in the vicinity of Kurnool, and Yaripilly east of Gooty. The cherts are usually of a greyish white, translucent, and sometimes of a faint roseate hue; while others resemble carnelian both in colour and texture. In veins and layers, it splits by microscopic fissures into parallelopipedal fragments. The red jaspers are often striped like the limestone with red and green. The limestone frequently graduates insensibly into these cherts and jaspers. A soft reddish and purplish laminar variety of the limestone prevails in the western parts of Kurnool and Cuddapah; and more or less in all the localities where this formation extends, passing by insensible gradations into the ordinary blue limestone of the country. The transition, however, is sometimes so abrupt, as almost to excite the idea of their being a distinct formation: but as yet, this conclusion cannot be arrived at in the absence of organic evidence. These red slaty and shaly beds are frequently interlaminated with thin light green chloritic flakes, which are also seen in the white marbly varieties of the limestones of Bagulcota in the Southern Mahratta country. In the dark varieties thin argillaceous lamellæ occur; which, in decomposition, turn of a light brown hue and become distinctly visible, alternating with the dark blue limestone.

In the vicinity of Bagulcota, Kulladghi, and Kurnool, the limestone acquires so crystalline a structure as to resemble the finer marbles. At Talicota, beautiful dendritic appearances occur inscribed on the successive surfaces of the laminæ, like characters on the leaves of a book, with features so strongly resembling those of vegetation as to induce Dr. Wight the botanist to believe they were organic, though probably the result of metallic infiltration.

The following is the note he sent me on the subject; and, if these appearances be really nothing more than the result of metallic infiltration, it will serve, at least, to show how closely they sometimes mimic the productions of the vegetable kingdom.

"The arborescent appearance in the slate I think an organic remain. At least, I find, when under a high magnifying power, that the black lines can, with the point of a needle, be picked off without touching the stone, as if the carbonaceous matter of the plant was still there. I feel uncertain, however, whether to call the original a *moss* or a *fucus*, but think the latter."

At Chillumcoor, in the Ceded Districts, the limestone is associated with a greyish breccia, having a coarse granular and crystalline structure, resembling that of granite, and imbedding small angular fragments of siliceous slate, and iron pyrites. The line of junction with the ordinary blue limestone could not be traced owing to the thickness of the superincumbent soil.

There are also some beds of a curious rock in the Southern Mahratta country south of Darwar, which, from their insulated position, circumscribed limits, and petrological character it would be premature to give a permanent place to in the formation under description. These beds constitute a hill near the village of Hurti with a mammiform shape, having its surface covered with detached, angular, and rugged masses of a similar rock, which appears to have been subjected to the action of violent disruptive forces. It is of a massive character, rarely laminar, veined with a white opaque quartz, and imbeds crystals of iron pyrites. It is composed of minute angular fragments of a dark glistening quartz, and crystals of pale flesh-coloured felspar, cemented together by a greenish, granular, subcrystalline paste, composed chiefly of carbonate of lime. It is very likely to be mistaken, from the colour, hardness, and granular texture, for a variety of massive siliceous, chlorite rock; and, in some varieties, resembles diallage and serpentine; but on the application of a lens, and, indeed, by the naked eye, its true aggregate character may be distinctly recognised. The application of dilute nitric acid to the rock in substance excites but a feeble effervescence; but from the powder, the extrication of carbonic acid gas is abundantly evident. Some varieties of a dull green hue, are traversed with reddish brown delineations. Before the blowpipe, *per se*, it phosphoresces slightly, and exhibits on the edges points of black shining enamel. The compact varieties are susceptible of a high polish, and are used as an [illegible] which often retains the pyrites bespangling [illegible] the smooth surface. The minute scales of mica, [illegible] felspar, and dark coloured quartz, together with [illegible] green hue of the rock, indicate its detrital origin from [illegible] and chloritic schists with which it is associated. No [illegible] itself showing the dip of its beds. The crystals of pyrites [illegible] weathering so rapidly as the embedding limestone, frequently stand out from its surface. This is the case with the veins of [illegible] and chert in the ordinary limestone of Cuddapah, the Southern Mahratta country, &c., exhibiting curious reticulations in relief on their exterior.

Associated Minerals.—The most prominent mineral characteristic of the limestone is the iron pyrites, abounding in nests and cubic crystals; and which, on atmospheric exposure, particularly where subject to moisture, acquire a liver-brown hue. Nests and strings of a poor hæmatitic iron ore are also pretty generally distributed; the former more particularly in the dark blue and green varieties; the latter is sometimes seen filling a succession of small spheroidal and tubular cavities in the substance of the rocks, which are not unfrequently empty; and have possibly originated in bubbles of inclosed air, or gaseous extrication, while the rock was yet in the state of a soft mud.

Galena is found in the limestone near Jungumrazpilly, Bussapur, Mahanandi, and other localities in the Cuddapah district; usually in brown jaspideous calcareous and white quartz veins, associated with iron ore and sulphate of barytes, a mineral hitherto unnoticed by writers on the geology of Southern India, and which occurs in the Nundi Cunnama Pass, over the Eastern Ghauts. Between the layers of the laminar, and more frequently in the argillaceous varieties, thin incrustations of muriate of soda are often found: and I have observed that, where this saline development is greatest, the rock is less solid, has an earthy fracture, and appears to have undergone a chemical change. Selenite is rare: a specimen of this mineral, labelled "Tiagar, southern division of Arcot," occurs in the Museum of the Madras Branch Royal Asiatic Society.

Coal has been discovered by Mr. Walker[1] in the limestone on the north limit of our area at Kotah, about ten miles up the Pundeetah river, above its confluence with the Godavery; where it is described as occurring as a vein in a layer of shale and bituminous shale, in the argillaceous limestone associated with the sandstone, and dipping at a low angle towards the north-east.

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[1] Journal of Asiatic Society of Bengal, No. 112, 1841, pp. 341, &c.

Organic Remains.—The almost total absence of fossils in this limestone, in Southern India, is a remarkable feature, and renders it impossible to assign it, for the present, a place corresponding with any of the classed formations of Europe or America.

In some of the chert veins in the limestone of Nannoor, in Kurnool, I recently discovered myriads of microscopic, spherical, and oval bodies, resembling at first sight the grains in oolite; but they are larger, and have a more organic appearance, resembling somewhat that of Bohemia. Their section, however, usually gives two or more concentric circles, with a point or nucleus in the centre, which have sometimes a distinctly chambered structure, like that of nummulites. These foraminifera exhibit no traces of carbonate of lime, being entirely silicified. In decomposition they fall out, leaving the surface of the stone so perforated with cavities, as to give it the appearance of coral. Their colour is usually white and opaque: the opacity is evidently caused by disintegration, but in others, translucent, like white carnelian. Those embedded in the red jasper-like chert frequently retain this appearance: some are entirely charged with the red colouring matter, while others have only the outer circles tinged by it.

Lithologic Character of the Sandstone.—The sandstone and its associated beds, lithologically speaking, are not very dissimilar to the Devonian sandstones of England, the finer chloritic slates of which, with their dendritic delineations, find resemblances in those of Chittywaripilly, between Cuddapah and Gooty, in the Budwail, and Cummum Divisions of the Eastern Ghauts, and in the vicinity of Kulladghi, alternating with hard quartzose slates, tilestones, and sandstones. Assimilations to the millstone grit are seen in the coarse white and red sandstones of Badami and Mudibhal in the Southern Mahratta country. In many localities, for instance Banaganpilly, Ryelcherroo, near Bagulcota, and the Juggernaut range of Kurnool, we find breccias and conglomerates passing into red sandstone and quartz rock.

The sandstone-capping portion of the Eastern Ghauts, from Naggery to the Mahanuddi, rarely passes into a breccia, and is seldom associated with the limestone on the more elevated portions of the Ghaut chain. Here it often assimilates the weathered gneiss on which it rests. It frequently passes into red and green argillaceous and siliceous slates, and laminated marls. Beautifully variegated sandstones, exhibiting waving and contorted bands, occur in the vicinity of Sidhout, Cuddapah district.

The sandstone conglomerate of Southern India is most remarkable for being the matrix of the diamond; and it is in absence of organic and other data to class it with any known formation, that it has been deemed convenient, from this almost peculiar mineral feature, to apply to it this temporary distinctive prefix. The diamond occurs both in the sandstone and its interstratified breccias and conglomerates, the pebbles in which are principally quartz, chert, flinty slate, basanite, jasper, and jaspideous clay impregnated with iron, with a few fragments of trap, and the hypogene schists. The pebbles of quartz greatly predominate; and it is worthy of note, that not a single bit of true granite has hitherto been found in these conglomerates. Those of chert, jasper, and indurated clay have evidently been derived principally from the subjacent limestone, and the rest from the hypogene rocks. Fossil chert from the limestone is often found embedded in the diamond breccias of Banaganpilly and of Ramulacota in Kurnool. As the diamond has never been discovered in these subjacent rocks, it cannot be said to exist as a transported crystal or fragment in the sandstone. The pebbles from the hypogene and limestone rocks are both rounded and angular, varying in relative proportions in different localities, and are found from the size of a duck-shot to that of a man's head. They are usually cemented together by an arenaceous paste, more or less fine and compact, mixed with argillaceous matter and oxide of iron. These conglomerates usually rest on the limestone, particularly the beds where the diamond has been found in greatest abundance. In many localities the limestone is entirely wanting, and the conglomerates and sandstone rest immediately on the hypogene strata. Granite, or basaltic dykes are invariably found intruding into diamond areas, of which as a detailed account has already been given, I will not dwell on them here. It may be noticed, *passim*, that in all alluvia in which the diamond is found, pebbles of this formation invariably occur. The most noted diamond localities are in the Cuddapah District, near Condapetta, Lamdoor, Penchetgapadoo, and Ovalumpully, at Banaganpilly, and in Kurnool at Bamulacotta, Devanur, Tandrapaud, and near the Nundi Cunnama Pass, near Gazoopilly; at Munimudgoo, and Wudjra Caroor near Gooty; at Malavilly, a village about sixteen miles W.S.W. from Ellore; at Ganipartata[1], or Partial, Alkur, Burthyenpada, Pertala, Wustapilly, and Codavetty Kalu; at Kattakindapalle, near Bombartipadu, about twenty-four miles northerly from Tripetty. Old diamond pits are also said to exist about forty-six miles west from Ongola, and about twenty miles north from Nellore. Large diamonds have been found from time to time in the bed of the Kistna, below the Moorcondah ferry in Kurnool.

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[1] Hayne's Tracts, pp. 92 and 110.

Most of the localities just enumerated were formerly within the ancient kingdom of Golconda, but are now under the British Government and the Nizam of Hyderabad. The diamond also occurs in the alluvia of the sandstone districts of the Mahanuddi, the Bramini and Ehee rivers, particularly the latter. There are diamond mines at Wyragurh, ninety miles S.W. of Nagpoor, formerly celebrated, but now nearly deserted.

Muriate of soda and sulphate of alumina occur frequently in thin seams and layers in the purple, reddish, and brownish shales, interstratified with the sandstone of the hills of Gokauk; and I found veins of manganese in the sandstone between the falls of the Gutpurba and Kulladghi.

Iron ores, chiefly magnetic and hæmatitic (specular and micaceous more rarely) are pretty generally distributed in veins with quartz and in nodules; iron pyrites occur less frequently in veins of white quartz.

Cavities filled with fine crystals of quartz, and sometimes embedded in calc spar, occur in the Juggernaut range of Kurnool. In these crystalline nests I observed a few laminæ of a mineral of a bright grass green colour, with a lustre and appearance resembling those of uranite. Galena occurs in the quartz veins of the Nulla Mulla chain and occasional detached strings and thin patches of carbonate of copper.

Anthracite has recently been found in the Goond country in the sandstone of Dantimnapilly, about twenty miles north-west from Jungaum, which is sixty-five miles west from Chinnore. The bed has an extreme breadth of three feet, and length 200 feet. Traces of coal are also said to exist in the diamond sandstone north-west of Nagpore, and it occurs in great abundance in similar rocks in the valley of the Nerbudda, a little further north.

The great intrusion of basalt into diamond areas has already been noticed, and it has usually been accompanied by evidence of heat, viz., induration and silicification of the limestone, fissures, and numerous thermal springs rising up through them, impregnated with carbonic acid. It is possible that this subterranean heat, during its periods of intensity, by acting on the limestone which has been shown to contain volatile vegetable matter, in addition to carbonic acid, drove off a portion of these in a gaseous form, with the superincumbent sandstone, and thus caused its diamondization, if I may be permitted so to express myself, by a process somewhat similar to that of the dolomization of limestone. The atoms of carbon set at liberty from their old combinations of lime, oxygen, and hydrogen, and having little affinity for the silica of their new matrix, gradually aggregated under the influence of certain laws in the pores of the sandstone, and assumed a crystalline form.

Organic Remains.—Although, as already stated, there is a certain degree of mineral resemblance between the sandstone beds of Southern India and those of the Devonian group, yet the singular ichthyolites, molluscs, and corallines that distinguished the latter are totally wanting in the former—that is, as far as has hitherto been ascertained. The sandstones supporting the coal measures at Chirra Punji, resting upon plutonic rocks, hypogene schists, and supposed to be identical with the diamond sandstones of Punna in Bundlecund, of Cuddapah, Kurnool, Banaganpilly, and Nagpore, are said to abound in teredines, and to imbed fossil stems and fruits of Mimosæ, while in its associated limstone, bivalved and univalved shells, with coralloids hitherto unclassed, are found, and a single gryphite[1]; this limestone, however, from its superior position to the sandstone, is probably of more recent origin than that just described.

A few impressions of stems and leaves of plants, one of which resembles a fossil Glossopteris Danæoides of the Burdwan coal-fields figured by Professor Royle, have been discovered by Lieutenant Monro in the Nagpore sandstone. There are two other impressions in Lieutenant Monro's specimens, bearing some resemblance, Mr. Malcolmson thinks, to the large bony scales of the sauroid fishes of the old red sandstone. However, they were so indistinct, that it would not be prudent to indulge in any speculation, until further discoveries be made. One of those impressions, which I carefully examined, bore resemblance to that of the reticulated skeleton of a leaf.

In the sandstone hill of Won, Mr. Malcolmson discovered a fossil of a deep black colour, and having a compact structure, which he conceives to be a portion of a hollow compressed vegetable; its centre is filled with sandstone. The carboniferous sandstones of Damuda, it is well known, contain fossil remains of the Vertebraria Indica, R.; of Sphenophyllum (?) speciosum, R.; of Glossopteris Browniana, Ad. Brongniart; Pustularia Calderiana; Precopteris Lindleyana, &c.

Age.—With regard to the age of the diamond sandstone and limestone, geologists are of conflicting opinions. Christie referred the latter to the transition period, and the former to the old red sandstone, without further evidence than mineral character, and their having been disturbed, with the hypogene schists, by plutonic rocks. Major Franklin[2] has referred the limestone to the lias, and the sandstone to the new red. Mr. Malcolmson[1] has already refuted the opinion of the latter, and states his conviction that they belong to the more ancient secondary, or even transition rocks. Major Franklin's theory appears to have been principally founded on the saliferous seams occurring in the sandstone; but in Southern India, as Mr. Malcolmson justly observes, salt occurs in all the formations, from granite to alluvium, and the blue limestone, classed as lias, almost invariably underlies the sandstone classed as the new red. A large sandstone track in Russia, long supposed identical with the new red, on account of its interstratified gypseous and saliferous beds, has recently been proved by MM. Murchison and Verneuil[2] to belong to the old red, from its imbedded ichthyolites. It is a well-known fact, that the old red in the north of Scotland is saliferous: salt springs occur in the English coal measures, in the lias of Switzerland, in the tertiary limestones of Egypt and Greece, and in the old transition slates of America.

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[1] Conybeare's Report to British Association, 1832.

[2] Geological Transactions, Second Series, Vol. III., Part I.

The frequent horizontal position of the diamond sandstone and limestone strata must not be regarded as a proof of recent origin. Granite, it is well known, has tilted up, and disturbed rocks of a period more modern than the chalk; while, on the other hand, the distinguished geologists first quoted found the older silurian rocks, covering a considerable portion of Russia, in perfectly horizontal stratification. Until the further discovery of organic remains enables the geologist to see his way more clearly, it would be advisable to refrain from any hasty and premature classification.

With respect to their age, relatively to other Indian rocks, it has been clearly shown, from superposition, unconformability of stratification, and imbedded pebbles, that they are posterior to the oldest hypogene schists, and anterior to the latest outbreaks of granite and basaltic greenstone, which have penetrated and altered their structure. A few pebbles of an older greenstone occasionally occur imbedded. I have already stated my opinion of an interval having taken place between the deposition of the limestone and the sandstone sufficient for the consolidation of the former, from the fact of a slight unconformability of dip, and of the latter's containing imbedded pebbles of a fossiliferous chert evidently derived from the limestone.

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[1] Geological Transactions, Second Series, Vol. V., pp. 568, 569.

[2] Ibid. Ibid. Vol. V., Report of Buckland's Anniversary Speech, 1841.

[*To be Continued.*]

Art. VIII.—*A few Observations on the Temple of Somnath; by* Captain Postans.

[*Read June* 15, 1844.]

As a strong feeling has been evinced by the Society that by means of graphic illustration the curiosities and monuments of antiquity in India should be rescued from oblivion, (a wish that has been most liberally met by the Honourable Company,) I have considered it somewhat conducive to the object in view to print the sketch which I took of the celebrated temple of Somnath during my visit to Girnar in 1838*, and of which a description was given in the Royal Asiatic Society's Journal for October, in that year.

The principal historical notices of Somnath which have reached us are comprised in the well-known accounts of Mirkhond, (in his Rozat-as-safá,) Firishtah, in his great History, and a curious and quaint story of the poet Sadi's visit to the temple, about two centuries after the invasion of the Saurashtra by Mahmúd of Ghazni. From these, as well as collateral accounts, it is certain, notwithstanding a great discrepancy as to the peculiar form of the idol or object of adoration which Mahmúd found on his visit in the beginning of the eleventh century of our era, that the temple of Somnath was one of the richest and most gorgeous shrines then existing in Western India, and that this wealth and renown formed no little portion of the inducements which influenced the Mohammedan march to that extreme corner of the Gujarat peninsula. Like everything of an historical character in India, the Hindús themselves are totally ignorant respecting the interest which attaches to Somnath, and certainly in and near the spot, the fact of Mahmúd's invasion, startling though it was, is quite unknown, and the building itself looked upon in its ruined state without the slightest approach to respect or interest of any kind. How far this apathy may extend into the interior of India I am not prepared to state, but certainly in no part of the Bombay Presidency, or amongst the Rajput tribes of Saurashtra, did I ever hear a syllable indicative of an acquaintance with an interest in the Somnath, except amongst the Jain priests of Girnar, who in their crude historical records designate it as *Chandra prabasa*, and appear to consider it as one of their shrines; but of its political history they know nothing. The vicinity has shared the veneration of pilgrims (with the neighbouring shrine of Dwarkanath and the whole line of coast,) from the legend which ascribes the death of *Krishna* from the arrow of his brother *Vali*, to a spot near Somnath, but to the temple itself they pay no respect. In an Upapurana it is mentioned as one of the twelve Lingas of Siva, and hence a great difference of opinion between learned commentators as to the Budhistical or Brahmanical character which should be assigned to the place when found and pillaged by Mahmúd: the able discussions on this point printed in the Asiatic Journal for May and June, 1843, must be referred to for every information on this head; it would ill become a mere observer and recorder of facts like myself to offer any opinion on so erudite a question; but as my impressions were given in 1838, so I venture to refer to them here, and will conclude this notice with the description I then gave of the actual appearance of the temple. Colonel Tod has quoted inscriptions found in the neighbourhood of Somnath, some of which I saw, and which appear to record repairs or additions made to the temple by petty princes or chiefs of Anthilwara; and the modern temple raised by Ahalia Bhye, near the ruin of the greater, is rather a proof that the Mahrattas considered the neighbourhood imbued with a certain degree of sanctity, as it certainly is to Hindús, than that they attached any interest to Somnath itself.

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* Published by Messrs. Smith and Elder, Cornhill.

Pattan, and all the part of the country wherein it is situated, is now under a Mohamedan ruler, the Nawaub of Junagurh, and the city itself offers the most curious specimen of any I have ever seen of its original Hindú character, preserved throughout its walls, gates, and buildings, despite Mohammedan innovations and a studied attempt to obliterate the traces of paganism; even the very musjíds, which are here and there encountered in the town, have been raised by materials from the sacred edifices of the conquered, or, as it is said by the historians of Sindh, "the true believers turned the temples of the idol worshippers into places of prayer." Old Pattan is to this day a Hindú city in all but its inhabitants—perhaps one of the most interesting historical spots in Western India. Mahmúd, we know, left a Hindú or a native ruler here, but successive changes have taken place since then, and various historians mention spoliations and conversions of the temples to mosques by succeeding conquerors, until Somnath assumed the appearance it now presents, of a temple evidently of pagan original altered by the introduction of a Mohammedan style of architecture in various portions, but leaving its general plan and minor features unmolested. Whether any or what portion of the original structure now stands as it was seen by Mahmúd in the eleventh century, I would beg to leave to more learned commentators to decide; I can only say, that in various portions, particularly the western front, where it is most perfect, it is rich in ornament, and by whomever raised or restored, the work must have been done at a period when zeal and wealth prompted the labour. Its material altogether is cyclopean, and even in its present state would, unless wilfully demolished, stand for centuries, though exposed to the trying effects of damp sea air, and for some portion of the year to the whole violence of the monsoon. I would here express a hope that it may long be allowed to stand as a remarkable monument of Indian history, replete with an interest of which its total or partial former demolition cannot deprive it. It can never be again used for the purposes to which it has heretofore been appropriated; and any slight efforts for its preservation could not, therefore, be misconstrued.

The following is the translation of an inscription in the Cufic character, transcribed by Major Rawlinson, which was found on the reputed gates of Somnath, brought, in 1843, by our victorious troops from the tomb of the champion of the faith at Ghazni.—"*In the name of the most merciful God* (may there be) *forgiveness from God for the most noble Ameer the great King, who was born to become the Lord of the State, and the Lord of religion, Abdúl Kassim Mahmúd, the son of Sabuktagin, may the mercy of God be upon him,*" (remaining phrase illegible.) A sketch of these gates has, I believe, been published, but it is curious to observe, whatever may have been their architectural character or material, as applicable to Somnath, whence vague tradition has assigned their removal, that there is no allusion to the exploit in the above, unless the illegible phrase may contain it.

The following is the description of the appearance of Somnath, which I have elsewhere ventured to describe with pen and pencil.

"This famous shrine occupies an elevated site in the north-western corner of the city of Puttan, on the western coast of the Gujarat peninsula, overlooking the sea and close to the walls. In its present mutilated state it may be difficult to convey any very distinct or correct idea of *Somnath*, for though its original design and gorgeous architecture may still be traced even in the complete ruin it presents, its general effect is likely to be better understood from an effort of the pencil than the pen.

"The temple consists of one large hall in an oblong form, from one end of which proceeds a small square chamber, or sanctum. The centre of the hall is occupied by a noble dome over an octagon of eight arches; the remainder of the roof terraced and supported by numerous pillars. There are three entrances. The sides of the building face to the cardinal points, and the principal entrance appears to be on the eastern side, (the view is taken from this quarter.) These doorways are unusually high and wide, in the Pyramidal or Egyptian form, decreasing towards the top; they add much to the effect of the building. Internally, the whole presents a scene of complete destruction; the pavement is everywhere covered with heaps of stones and rubbish; the facings of the walls, capitals of the pillars, in short, every portion possessing anything approaching to ornament, having been defaced or removed, (if not by Mahmúd, by those who subsequently converted this temple into its present semi-Mohammedan appearance). On a pillar beyond the centre arch, and leading to the sanctum, is an inscription which, anxious as I was to learn anything connected with the temple, much excited my curiosity. On translation, however, it proved to be merely a record of a certain *Selât* or mason, who visited the place some 300 years since. I learnt, to my inexpressible regret, that an ancient tablet, whose unoccupied niche was pointed out to me, had been removed from Somnath some years ago by a European visitor. I need hardly quote Col. Tod's remark on this mistaken, though I fear too frequent practice; but if what he says be applicable to the mere architectural ornaments of a building, how much more so to engraven records similar to that which is here wanting.

"Externally the whole of the buildings are most elaborately carved and ornamented with figures, single and in groups of various dimensions. Many of them appear to have been of some size; but so laboriously was the work of mutilation carried on here, that of the larger figures scarcely a trunk has been left, whilst few even of the most minute remain uninjured. The western side is the most perfect: here the pillars and ornaments are in excellent preservation. The front entrance is ornamented with a portico, and surmounted by two slender minarets —ornaments so much in the Mohammedan style, that they, as well as the domes, have evidently been added to the original building. The two side entrances, which are at some height from the ground, were gained by flights of steps: of these latter the remains only are to be traced. The whole space, for a considerable distance around the temple, is occupied by portions of pillars, stones, and fragments of the original building."

Such is a brief description of the present appearance of the renowned *Somnath*, which, notwithstanding its original spoliation and subsequent alterations, must always prove an object of great interest to all who have studied the history or antiquities of India. I must not omit to mention, as a proof of the wonderful solidity of this structure, that within a few years its roof was used as a battery for some heavy pieces of ordnance, with which the neighbouring port of Virawal was defended from the pirates who previously infested the coast.

Art. IX.—*Report on some of the Rights, Privileges, and Usages of the Hill Population in Meywar; by* Captain W. Hunter, *of the Meywar Bhíl Corps.*

[*Read February* 25, 1843.]

Respective Rights of Sovereign Chiefs and Subjects on the Hilly Tract between Sirohi and Doongurpore.

This question appears to have been first seriously agitated in 1826, in consequence of a reference from the Acting Political Agent in Meywar, Capt. Sutherland, to Sir C. Metcalfe, regarding certain Grasya chiefs of the Hill principalities, nominally independent, but from whom allegiance was claimed by the Oodeypore Government.

In reply to the above reference, Sir C. Metcalfe expressed himself of opinion that those chiefs whom he found independent when our mediation was established in this part of India, and who might be able to show that they had not for a considerable period prior to our mediation acknowledged submission to any power, should be recognised as still independent; and that in that case we ought not to lend our aid to reduce them: this was the general principle established by Sir Charles Metcalfe, upon which to regulate our conduct towards these states; but for a more particular solution of the question in each case, the Political Agent at Oodeypore was desired to have recourse to an investigation of the claims to allegiance set up on the one hand, and of the grounds of denial on the other.

Consequent on these instructions, Capt. Cobbe, in the course of conversation with the Minister of Rana Bheem Sing, endeavoured to ascertain whether, within the period of his Highness's existence, any chout, tunkhwah, or other tributary payment, had been made to the durbar by the chiefs of the Grasya tribes of Joora, Meerpoor, Oguna, and Panurwa, and whether any engagements of the kind had existed during the same period.

The Minister's answer was such as to satisfy Capt. Cobbe that the claims of the Rana to supremacy over these chiefs had been in abeyance for a period far exceeding the term adverted to. The Rana Bheem Sing disavowed the collection of any revenue from them during his long reign of nearly half a century, and admitted that during that period the Grasya chiefs had never voluntarily afforded, nor had he been able to enforce any service or tribute from them. Capt. Cobbe therefore considered that the Oodeypore chief had failed in substantiating a claim to supremacy over the chiefs of Joora, Meerpoor, Oguna, and Panurwa; and that, on the principles laid down in Sir Charles Metcalfe's letter of instructions under date 9th December, 1826, the independence of these chiefs was indisputably established.

Assuming this point to be fully settled, the next subject of consideration was what course it might be prudent and necessary to adopt to oblige these chiefs to afford protection to travellers against the violence and outrage of those over whom they claimed unqualified jurisdiction, and to induce them, whilst respecting the rights of their neighbours, to afford every encouragement to the cultivation of such resources as they possessed within the limits of their respective territories.

Capt. Cobbe, in consequence of the poverty and weakness to which these chiefs had been reduced by a long period of anarchy and confusion, recommended that to carry these views into execution, some assistance should be afforded them by the British Government, more especially as in their unsettled and disorganised state, if left to themselves, they were avowedly and manifestly unable to control their subjects, or to obtain from them anything more than a scanty and uncertain income, granted rather to hereditary claims than exacted by the power of the chiefs.

In common cases of real or pretended inability on the part of the chiefs to repress the outrages and aggressions of their subjects, the power to whom the general tranquillity is confided, Capt. Cobbe argued, was entitled to assume the management of the estate; and though, owing to the extreme poverty of the country, such an assumption would in all probability prove anything but profitable to the paramount power, still, from the position of the states bordering on Edur, Gujarat, Sirohi, and Palhanpore, it was, in Capt. Cobbe's opinion, of the highest importance that such arrangements should be adopted by the British Government as would effectually insure the suppression of the constant predatory irruptions of the Bhíls, and oblige the chiefs themselves to refrain from committing aggressions on the neighbouring principalities.

In reply to these observations, Sir Charles Metcalfe, in a letter dated 18th December, 1826, remarked, that as the Grasya chiefs were independent, and did not acknowledge allegiance to Oodeypore, or any other state, it would be necessary to negotiate with them on our part: that it did not, however, appear to him that the chiefs in question had any claim to our assistance, and that they were not even entitled to our protection: that we required nothing from them but the security of our own subjects and allies against the predatory irruptions of the people over whom they professed to have sovereignty, and a safe passage through their territories for travellers and merchandise.

The first of these demands, if not both, Sir Charles observes, we are entitled to, and even bound, in justice to others, to insist on; and should the chiefs be unable to give us satisfaction on that point, we have an unquestionable right, in defence of our subjects and allies, to subjugate the country of the offenders.

Such Sir Charles Metcalfe conceived to be the proper and only principles of any negotiation to be opened with these chiefs. "We hereby," he says, "ask nothing but what we have a right to require: if, therefore, they withhold it, they become public enemies: if they be unable to effect it, they virtually abdicate the sovereignty to which they pretend over all whom they cannot restrain from outrage."

In conformity with these principles, Sir Charles recommended that the Grasya chiefs should be called on to state distinctly what portion of territory they could be responsible for, and what portion was beyond the exercise of their efficient sovereignty. He did not think it desirable that the expectation of assistance should be encouraged, but in the event of their soliciting it, they were to be called on to state in what particulars, and for what purposes, it would be wanted; as also what equivalent they might be prepared to pay for assistance which they could not in equity expect gratuitously.

On the above principles, as far as they could be acted upon without involving a violation of any manifest rights appertaining to the Rana of Oodeypore, Capt. Cobbe was authorised to enter into negotiations with the Grasya chiefs, himself directly, or to entrust the business to Capt. Black as a part of the duties of a deputation on which he was about to be employed under the orders of the Political Agent.

Capt. Black proceeded towards the Hills in January, 1827, but unfortunately owing to the rebellion of the celebrated Dowlut Singh, the manager of Jowass, all his efforts to overcome the disaffection of the Grasya chiefs proved unavailing, and nothing was accomplished till the cold weather of 1828, when Capt. Speirs, supported by a force of upwards of 2000 of our own men from Neemuch, under the command of the present Major-General Burgh, succeeded in persuading Dowlut Singh, together with the chiefs of Joora, Oguna, and Panurwa, to render their submission, and to acknowledge the supremacy of the British Government.

The claims of the Grasya chiefs to independence were at this period fully established on the principles laid down in Sir Charles Metcalfe's instructions, and the justice of a claim thus recognised by the Governor-General's Agent for the affairs of Rajpootana, and afterwards ratified by the Supreme Government, would seem to be supported by the authority of Capt. Tod, who, in regard to the states under discussion, remarks as follows:—

"The principalities of Oguna, Panurwa, and Meerpoor, are inhabited by communities of the aboriginal races, living in a state of primeval and almost savage independence, owning no paramount power, paying no tribute, but with all the simplicity of Republics[1]." "Oguna Panora is the sole spot in India which enjoys a state of natural freedom; attached to no state; having no foreign communications; living under its own patriarchal head, its chief, with the title of Rana, whom one thousand hamlets scattered over the forest-crowned valleys obey, can if requisite appear at the head of 5000 bows. He is a Bhoomia Bhíl of mixed blood, from the Solanki Rajpoot on the old stock of pure (oojla) Bhíls[2]." "The descendants of Baleo and Deeva, the Oguna and Oondree Bhíls, celebrated as the faithful guardians and companions of the fugitive Bappa Rawut, the great ancestor of the Oodeypore royal family, still claim the privilege of performing the teeka on the inauguration of a new sovereign, on which occasion, besides making the teeka of blood drawn from the finger of a Bhíl, the Oguna chief is entitled to take the prince by the arm, and seat him on the throne[3]."

Though the Rana of Panurwa disclaims the feudal supremacy of the Rana, owing to the long time it has been in abeyance, as well as on account of the uncertain and indefinite nature of such claim when it has been temporarily recognised, still he acknowledges to Capt. Speirs that his ancestors, many generations back, had a certain gate in the Hills entrusted to their charge, where they were bound to keep up a stipulated number of horse and foot, and for the performance of this duty the Rana of Oodeypore bestowed upon them several villages. These villages at a subsequent period having been resumed, the above service was discontinued, and their dependent condition again wholly disappeared.

The Oguna Rawut is a younger branch of the Panurwa family, and acknowledges the supremacy of its chiefs. No member of the Oguna house can take his seat on the Gaddí till placed therein by the chief of Panurwa, who girds on his sword, and receives the usual fine of investure. Whether any engagements have been entered into subsequent to the treaties settled by Capt. Speirs in 1828, I have not had the means of ascertaining.

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[1] Tod, Vol. I., p. 10.

[2] Ibid. p. 224.

[3] Ibid.

The valley in which Joora is situated, as also the villages of Oguna and Panurwa, extends from north to south about fifteen coss, varying in breadth from five miles to three and two. The population is considerable, and the soil extremely fertile, producing as fine fields of wheat and barley as are to be seen in any part of India. The inhabitants cultivate the sugar-cane and ginger, and many valuable drugs used by native physicians are also produced on these Hills. The chiefs themselves are said to derive little benefit from all these advantages, their share of the revenue or produce being very much in the proportion to the power they possess of exacting them from their subjects, the more powerful of whom have been in the habit of giving what they do, more as a benefaction to the chiefs, than from any acknowledged or inherent right on their part to enforce it.

The country is by nature exceedingly strong, and the difficulty attending military operations is much enhanced by the great scarcity of water, the absence of every species of cattle and carriage, and the difficulty of procuring supplies and information. March and April are perhaps the most favourable months for military operations, when, in consequence of the scarcity of water in the Hills, the Bhíls and their cattle are compelled to descend to the valleys; and on these occasions they are easily surrounded; but this, owing to the scattered site of their hamlets, is very difficult, if not impossible, to accomplish when they once get to their Hills. Nothing alarms the Bhíls more than the probable loss of the Indian corn, or Kharíf crop, which is cultivated during the rains, and on which they chiefly subsist. Their dread on this score has often induced the rebellious Bhíls to surrender, and to give hostages or security for future good conduct, when all other means have failed to reduce them to subjection.

In the Grasya Hills, as well as in the Jowass District, there exist numerous petty chiefs of the same caste as, and acknowledged by the population; which, with the exception of a few Baniyas in the principal villages of each chief, consists almost entirely of Bhíls and Grasyas. The whole body of the governed are there naturally connected with their rulers; and were these only more solicitous of the public welfare, and more disposed to exert themselves, their influence and power would no doubt avail much to suppress the indefensible outrages so frequently committed by their turbulent and unruly subjects.

In Chupan and Doongurpore the relations between chief and subject are on a very different footing. In those tracts, no chief of

Bhíl or Mína extraction is to be found. The people have there been for ages in partial subjection to the Rajpoot chiefs, between whom and the Bhíl no bond of union or attachment, except that of community of crime, ever appears to have existed. Moreover, owing to the constant residence of these chiefs on their estates, the population in that quarter has naturally become very mixed—so much so, that in some parts of Chupan, it is supposed that the Bhíls are outnumbered by the other classes of inhabitants,—Rajpoots, Baniyas, artisans, traders, &c.

Amongst the tribes which had made themselves particularly conspicuous by their predatory habits in these Hills are the Moghías. They are mercenary foot soldiers, usually armed with tulwars and matchlocks. They have the reputation of being a bold, hardy, and enterprising, but very debauched race: trained to plunder and fatigue, and at all times willing to sell their services to the highest bidder. They are originally from Joudpore, whence they were expelled about seventy years ago by Raja Bajee Sing. They eat every kind of flesh, even to the cow and jackal, and are sadly addicted to strong liquors. Their Jamadars or leaders, whom they obey implicitly, are usually mounted, and, like most Hindus, they have the reputation of being true to their salt, or employers, but never fail to return to their plundering habits the moment they are released from service.

A strong party of Moghías, under the orders of their leader Humauth, were in the service of Dowlut Singh, the Manager of Jowass, during the period he was in rebellion in 1827-28. In April 1828, information was received of the death of Humauth, in a plundering expedition he made into Gujarat. He had long been one of the most dangerous and turbulent characters in this quarter, and had, on various occasions, given much trouble to the Government officers.

GENERAL REMARKS REGARDING THE BHIL TRIBES.

The fabulous traditions of the Hindus have supplied us with the following extravagant account of the origin of the Bhíls. Mahadeo, when sick, was one day reclining in a forest, when a beautiful damsel appeared, the first sight of whom effected a complete cure of all his complaints. The result of this interview was the birth of many children, one of whom, distinguished for his ugliness, slew the favourite bull of Mahadeo, for which crime he was expelled to the woods and mountains; and his descendants have ever since been stigmatised with the names of Bhil and Ushaster, or Outcast.

The Bhíls, it has been remarked, have ever been considered a degraded race, the very refuse of society; and the estrangement and despair which such a notion is sure to generate, whilst it tends to cut off all those more kindly and humane feelings which, in other classes of even the Indian community are generated between man and man, naturally prompts them to acts of outrage against their fellow-creatures, and reconciles them to those habits of rapine and plunder which their traditions teach them they were created to follow, and which for ages have rendered them a scourge to society.

Without any fellow-feeling for the rest of the community, who hold them so low and so degraded, with such an impression as to their destiny from their birth, inured to hardships, especially to live in the open air, and to the use of arms, and caring little for a life which, under the most favourable circumstances, affords few comforts and little gratification beyond that enjoyed by the brute; the course of reckless violence, and wanton cruelty they have always pursued cannot excite much astonishment.

The Bhíls are usually divided into two classes,—the village or the cultivating, and the wild or Mountain Bhíls. They generally, however, preserve the same usages, and the same forms of religion; but in those parts of the country where the Bhíls appear more humane and less reckless of their own and others' lives, it has generally been found that they are not so destitute of the means of existence; and that in proportion to the abundance, or otherwise, of these essentials, they are generally more or less disposed to live in peace and quietness.

A vicinity to the Hills in every country has invariably been found favourable to the systematic aggressions of plundering tribes possessing retreats among fastnesses of mountains and extensive jungles; and to repress the outrages of such local banditti has at all times proved a task of no common labour and difficulty. It has been very justly remarked, that it is no reflection on the irresistible nature of the power and policy of the Indian Government, that we have not succeeded at once in this object. In more civilized countries, in Greece, Spain, and Italy, the best efforts of Government have failed in effecting the extirpation of such illegal communities; and even England does not consider herself disgraced, notwithstanding all the efforts of her navy, —all the activity and discipline of her trained bands and military on shore, have been ineffectual to put down the system of smuggling.

We can therefore but too well conceive that among clans such as the Bhíls, plunged as they are in the grossest and most debasing ignorance; unshackled by any laws; in many parts of the country recognising no Government; and accustomed to set every principle but that of violence at defiance, it must prove a very difficult and delicate task, even by the application of the wisest and gentlest measures, to replace with the forbearance of civilized life, that desire for feud, and that lust for unlawful possession which is common to all barbarous tribes. Plunder, to a Bhíl, has hitherto been the charm of his existence: plundering they designate *shikar*, sport; and the prospect of driving off a few bullocks, possessing themselves of the property of travellers, or of a field of ripe grain, has hitherto, in the estimation of these strange people, been found to outweigh all the advantages which have at different times been held out to them by the offer of regular employment. I trust, however, that in the disinterested experiment which, under the authority of the British Government, is now being made to ameliorate their moral and physical condition, we are in a fair way to establish a better order of things. The mild and humanizing spirit of these measures, aided by the cementing influence of good and regular pay, can hardly fail to produce the usual effects in this quarter; and after the several Bhíl corps shall have been successfully organized, as we gradually succeed in bending the people to our sway, by giving a new aim, character, and interest to their existence, as we gradually succeed in soothing their exasperated passions, and in awakening them to habits of discipline, industry, and sobriety, we may hope to obtain a very powerful pledge against future irruption, and that constant disturbance of the public tranquillity which has hitherto been the bane of this misgoverned country.

That the Bhíls in this tract, by long giving license to the most lawless and predatory habits, should have rendered themselves obnoxious to the severest penalties, can hardly excite surprise, when we reflect on the moral and political disorganization—I may say, the almost irremediable confusion of every portion of the Rana's dominions at the period of our mediation. Captain Cobbe, in adverting to this lamentable subject, does not hesitate to affirm that, in his time, from the prince to the peasant, all were thieves and robbers throughout the province; and remarks, there is no security for person or property. The Government is a tissue of cheating and oppression, without even the semblance of law and justice; and its influence and example are but too glaringly manifest in the shocking depravity and demoralization of all classes of the people.

Thus the Bhils and Grasyas, occupying the tract between Sirohi and Doongurpore, as also those in Chupan, have at one time been encouraged to the commission of outrage by the example of those whom they have been accustomed to recognise as their chiefs, and to whom they have been obliged to surrender a portion of the fruits of depredations. At other times, they have been goaded into rebellion by the violent and oppressive administration of the Rana's Kamdars, as well as by the overbearing, and often cruel conduct of the irregular troops which, under the control of those state harpies, have been stationed at the different *thannas* to enforce the orders of the Durbar.

Another cause of the violent and vindictive spirit which has occasionally hitherto exhibited itself amongst the Bhíl population, may be traced to the attempts on the part of the Durbar to deprive the Bhíls of the privileges of levying rakhwalee, or black-mail, on travellers and merchandize. The Bhíls have the reputation of being particularly tenacious regarding this privilege; and hitherto any attempt to abolish it has been productive only of disastrous consequences. When their dues are paid the Bhíls seldom commit depredations: when withheld, no native power has yet been able to coerce them. Travellers and merchants pass through their Hills without molestation or interference, after paying the usual tax, and property under their charge is rarely plundered or touched. On the other hand, if any attempt be rashly made by travellers to force a passage without paying the dues, they are certain to be pillaged. Thousands of these warlike spirits, as their war-scream is re-echoed from hill to hill, will immediately collect from every hamlet in the neighbourhood to resist this, or any other innovation.

PRIVILEGES, CUSTOMS, AND HABITS OF THE BHILS, MORE PARTICULARLY THOSE INHABITING KURRUCK, KHAIRWARRA, AND THE HILLY PORTION OF CHUPAN BETWEEN DOONGARPORE AND OODEYPOOR.

As I have before observed, one of the most important privileges to which the Bhíls lay claim, is a right to levy a tax denominated indifferently rakhwalee, chowkee, and bolaee, on all travellers and traders passing through their country, in return for which they are responsible for their safety and protection. The sum paid on these occasions appears never to have been exactly defined: it varies in different parts of the country, and has sometimes been regulated by the known or supposed wealth of the parties.

When the Rajpoot chief was powerful enough to keep the Bhíl population in due subjection, this tax was levied by him directly, either at the borders of his district, or in the town where he resided: but such Bhíl Pals as did not acknowledge obedience to the Rajpoot chief (though nominally his dependants), assumed the right of enforcing the above tax on their own account; and this custom now obtains over a great portion of the Hill Districts.

In addition to the above tax, the Chief has been in the habit of exacting customs on all grain and merchandize passing through his districts; as also the Mafra, which is a tax on all produce taken from one village to another within the district.

The Bhíls of powerful Pals, who are in the habit of plundering the villages in Meywar, Doongarpore, Pertabghur, Sedur, &c., frequently enter into engagements with certain Ryot villages to receive chowkee or rakhwalee. By this arrangement the Bhíls are secured a certain quantity of grain, or a specified number of cattle from the village, in return for which they are under an engagement, not only to abstain from the future plunder of its inhabitants, but likewise to afford them protection against the depredations of others. This protection is not secured on all occasions by the Bhíls keeping a watch for the protection of the Ryots, but by the power which the Bhíls receiving the rakhwalee possess of attacking and forcing the members of any other Pal to make restitution of all property plundered from the village under their guardianship. The Ryot villages, however, have sometimes been under the necessity of paying two or more Pals for this protection; and in addition to the above tax, the Ryot villages often give a quarter of their crops to the Rajpoot chiefs, either in money or kind; provide also for the maintenance of a certain number of horses; pay a fine for the marriage of any individual of the family; supply funds for the repair of the Chief's house, wells, &c., and are, besides, subject to other compulsory fines.

The Rajpoot chiefs also claim a fourth of the agricultural produce of the Bhíl Pals; but this is seldom paid in kind by any of the Bhíl communities, excepting those in the immediate vicinity of the Chief's residence. The sum claimed in lieu thereof it has been usual to discharge every two or three years from a portion of the cattle they for that purpose may have driven from the adjoining states. Frequently, however, in order to obtain his dues, the Chief has himself been obliged to attack the rebellious Pals; on which occasion everything his followers can lay hands upon is seized and carried off: but women, children, and cattle are generally restored, on the payment of a sum of money, amounting to about five rupees per head. A certain portion of all property, such as money, jewels, cloths, captured by the Bhíls is also claimed by the Chief, who, in some instances, has with his followers been known to accompany the marauding parties.

In the year 1818, in consequence of the alliance of Meywar with the British Government, the Rajpoot Chiefs having been summoned to the Durbar by Captain Todd, they were induced to submit to His Highness; who, on redeeming that portion of the Khalisa-lands which had been forcibly usurped, and granting them sunnuds for their original estates, thought fit to prohibit these chiefs from exacting the rakhwalee and tax which had only been submitted to by the Khalisa villages in consequence of the inability of the Rana's government to afford them the protection to which they are entitled.

The engagements entered into between the Rana and his chiefs, on the above occasion, are detailed in the following treaty:—

Charter given by the Rana of Meywar, accepted and signed by his Chiefs, defining the duties of the Contracting Parties, A.D. 1818.

Seid Sree Maha Rana Dheroj, Maha Rana Bheem Sing, to all the Nobles my brothers and Kin, Rajas, Patels, Jhalas, Chohans, Chondawuts, Pawars, Sarangdests, Suktawuts, Rahtores, Rawuts, &c., &c. Now, since Samvat 1822 (A.D. 1776) during the reign of Sree Wur Singh-ji, when the troubles commenced, laying ancient usages aside, undue usurpations of the land have been made; therefore on this day Bysakh Badi 14, Samvat 1874 (A.D. 1818) the Maha Rana assembling all his chiefs, lays down the path of duty in new ordinances.

1. All lands belonging to the Crown obtained since the troubles, and all lands seized by one chief from another, shall be restored.

2. All Rakhwalee, Bhoom, Sagat (dues) established since the troubles, shall be renounced.

3. Dhan Bisioo (transit duties) the right of the Crown alone, shall be renounced.

4. No chiefs shall commit thefts or violence within the boundaries of their states. They shall entertain no Thugs, foreign thieves, or thieves of the country, as Mogees, Baories, Shories; those who shall adopt peaceful habits may remain, but should any return to their old pursuits, their heads shall instantly be taken off. All property stolen shall be made good by the proprietor of the estate within the limits of which it is plundered.

5. Home or foreign merchants, traders, kafilas, brinjarries, who enter the country, shall be protected: in no wise shall they be molested or injured; and whoever breaks this ordinance, his estates shall be confiscated.

6. According to command, at home or abroad, service must be performed. Four divisions (Chokies) shall be formed of the chiefs, and each division shall remain three months in attendance at Court, when they shall be dismissed to their estates. Once a-year, on the

festival of the Dussera, all the chiefs shall assemble with their quotas, ten days previous thereto, and twenty days subsequent they shall be dismissed. On urgent occasions, and whenever their services are required, they shall repair to the Presence.

7. Every Pattawut holding a separate patta from the Presence, shall perform separate service. They shall not unite or serve under the greater pattawuts; and the subvassals of all such chiefs shall remain with and serve their immediate Pattawuts[1].

8. The Maha Rana shall maintain the dignities due to each chief according to his degree.

9. The Ryots shall not be oppressed: there shall be no new exactions or arbitrary fines: this is ordained.

10. What has been executed by Thocoor Ajeet Sing and sanctioned by the Rana, to this all shall agree[2].

11. Whoever shall depart from the foregoing the Maha Rana shall punish: in doing so the fault will not be the Rana's; whoever fails, on him be the oath (án[3]) of Eklinga, and the Maharana.

The result of the above arrangement, though not effected without much ill-blood, as was to be expected when so many conflicting interests were to be reconciled, was a temporary move towards peace and repose. But it was of short duration. Several of the turbulent chiefs, who, under various pretences had on the above occasion declined attending the durbar, continued to enforce the collection of the rakhwalee, or, in the event of non-payment, to plunder the villages; and as the chiefs who tendered their submission declared their incompetency to restrain their Bhíls, the country was soon thrown back into a state of anarchy; and to so dangerous extent as to render it expedient to aid the government of Meywar by the employment of a British Force.

The Bhíls, by these measures reduced to submission, and having entered into written engagements to deliver up all their arms, and to abstain from plunder, and from the exaction of rakhwalee, were in the first instance placed under the immediate control of his Highness' officers.

Shortly after this arrangement the greater portion of the Bhíl Pals were restored by the Rana to the Rajpoot chiefs, on their promising to be answerable for the conduct of the Bhíls, as well as for the protection of travellers and traders. It was very soon, however, apparent that the Rajpoot chiefs were neither willing nor able to fulfil their engagements; and several who were notoriously disaffected to the Rana's cause, hesitated not to aid in openly obstructing the measures of government. These circumstances, combined with the frequent defeats which the Rana's troops sustained from the rebel Dowlut Singh and his Bhíls, gave great confidence to the latter; the result of which was the re-establishment of the rakhwalee system on its former footing; when all traders and travellers refusing to pay his compulsory tax were invariably plundered, and sometimes murdered.

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[1] This Article has become especially necessary, as the inferior chiefs, particularly those of the third class, had amalgamated themselves with the head of the clans, to whom they had become more accountable than to their prince.

[2] This alludes to the treaty which the chief has formed, as Ambassador to the Rana, with the British Government.

[3] *An*, oath of allegiance. Tod, Vol. I., p. 172.

In 1828, notwithstanding the Bhíls were again reduced to submission by the force under the orders of Capt. Speirs, the abolition of the rakhwalee tax does not on that occasion appear to have been insisted on; and the system is now in force not only along the whole line of road between Oodeypore and Doongurpore, but I believe obtains in most parts of these hilly tracts. In bad seasons, it appears to be almost the only means the Bhíls have of supporting themselves without plunder; and, accordingly, as I have before observed, to deprive them of this privilege only tends to excite the flame we would wish to extinguish, and to render the Bhíls more intractable, and more determined to set the authority of their sovereign at defiance. In return for this tax the traveller is furnished with a guide and protection, the Pal in the receipt of the bolaee becoming accountable for any loss.

APPEARANCE OF THE BHÍLS.

The Bhíls of the Vindya range have been described as a very hard-featured race. In this tract of the country many of the young men are particularly good-looking; and some of their women handsome, and remarkable for the elegance of their figures. They are said to be prolific, and very faithful to their husbands, whom they often accompany on their marauding excursions, and even to battle, carrying provisions and water, and sometimes themselves facing the enemy, and armed with slings, in the use of which many of them are very skilful. They cheerfully undergo great labour in these plundering expeditions; are generally, both men and women, very abstemious as regards food, though addicted to liquor; and have few wants which are not easily supplied by night attacks upon villages from any range of hills on which they may take up their position.

Fidelity of the Bhíls.

The fidelity of the Bhíls to their acknowledged chiefs is very remarkable. This feeling is quite independent of what we should consider the justice of their cause, the Bhíls, owing to their ignorance, being totally disqualified for the discussion or comprehension of such matters. The direction of their chief is all they look to; and so wonderful is the influence of the chief over this infatuated people, that in no situation, however desperate, can they be induced to betray him. If old and incapable of action they will convey him to places of safety. No hope of reward or fear of punishment affects them; and under the orders of their master they exult in the plunder of all those classes by whom they are considered and treated as the lowest of the human race.

During the period Capt. Black was employed in this quarter, though instant intelligence of all his movements was conveyed to the rebel Dowlut Singh, he was never himself able to obtain any information regarding the nature of the country, or the numbers, positions, and motions of the enemy. But on this subject I cannot do better than quote Capt. Black's own language, who, in reference to the proceedings in Kurruck and Chupan in 1827, remarks as follows:—

"Intelligence is not procurable for any sum of money; whilst not a single guard can quit this post without the strength and destination of it being instantly reported to the rebels, who remain concealed in the jungles or hills, ready to take advantage of the excellent information they receive. To counteract this, I frequently attempted to change the position of a guard during the night, but generally without success. In some instances my men refused to move till daylight; but whenever they did, the intelligence was instantly conveyed from hill to hill."

Capt. Tod, in illustration of the faith which may be placed in the pledged word of the Bhíls, relates as follows:—"Many year ago one of my parties was permitted to range through this [Aravulli] tract. In one of the passages of their lengthened valleys the lord of the mountain was dead; the men were all abroad; and his widow alone in the hut. [My servant] Madarri told his story, and claimed her surety and passport, which the Bhílni delivered from the quiver of her late lord; and his arrow, carried in his hand, was as well recognised as the cumbrous roll, with all its seals and appendages, of a traveller in Europe[1]."

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[1] Tod, Vol. I., p. 11.

In some of the Bhíl districts, the arrows are used in lieu of drafts for money. The Selput Bhíl chief, on the occasion of a visit from some of the Native Government Agents, wishing to make them a present, regretted that a fire had destroyed all his cloth, &c., &c. "But, never mind," he said, "take this,"—drawing an arrow from his well-filled quiver,—"take this to any village of Kotah, and demand nine rupees." To another, he gave one on a second village to demand five rupees; which on being presented were honoured at sight; the Patels stating that they knew too well what would be the consequence should they refuse the arrows as drafts for money.

Owing to the impossibility of obtaining any authentic records regarding this strange race, the information which I have been able to collect from different sources is necessarily of a very cursory and superficial description; and the very defective communication which I now venture to make is not offered as one to be depended upon, but merely as a rough statement supposed to approach nearly to the truth; and which may, in some measure, serve as a guide, till a local investigation of the country, and a more thorough knowledge of the history, customs, and character of these tribes shall enable us to form a better judgment, and authorise my offering an opinion on this important subject with more confidence than I can presume to do with my present very limited experience.

Khairwarra,
20th July, 1841.

APPENDIX.

No. I.—Comprises copies of treaties with Grasya chiefs of Meywar made in the beginning of 1828, by mediation of Major Speirs. These are generally engagements to cease from disturbance and plunder, and from entertaining rebels; and to attend the government in its service when called upon; to hold themselves responsible for losses sustained by travellers and traders within their territories; and to collect their revenues according to a regulated system.

No. II.

Miscellaneous Remarks on the Character and Customs of the Bhíls; by Colonel Robertson, formerly Collector in Candeish.

The Bhíl banditti are a timid race; screening themselves in fastnesses, and only, like beasts of prey, venturing abroad under cover of the night, or in the absence of forces. The men as well as the women, are very hard-featured. The clothing of the men is often not more than the calls of decency require. They can live on the products of the wilds, for a considerable time; but generally they show every sign of being badly fed. This is not because they cannot find employment, for they can all cultivate if they choose, but because they are inveterately idle, and would rather eat half a meal of indifferent food, provided they are not obliged to work, than a good and substantial meal procurable by labour. In their plundering expeditions they often live in the fields, at their appointed stations, with their families; and all their stock and effects consist generally of not more than a wretched cow or buffalo, a few fowls, a small fishing-net, and now and then a sword or matchlock, with a bow and plentiful supply of arrows. They are very cruel and regardless of life; will, any day, become assassins for a trifling recompense, and are very revengeful; they themselves comparing their enmity to the bite of a snake. They are immoderately fond of liquor; and it is to the quantity expended that the marriage of a Bhíl owes all its *éclat*. Rather than be deprived of this luxury for any time, they will resort to every excess. They kill and eat the cow, and have little or no religion. They share equally in plunder, except when under an hereditary chief, whose share is then a chowth.

The term Tarvi, applied to the Mohammedan Bhíls, supposed to have been converted to that religion in the reign of Aurungzeb, Sir J. Malcolm erroneously supposed to be a title.

The Mohammedan Bhíls are cleaner in their persons than the Hindu Bhíls; have better features; and are more civilised, speaking Hindustani.

The Patels often encourage the Bhíls in plunder, in order to share in their spoils.

The different classes of Bhíls are the Turvo, Nahallo, Bhílalas, Kokanís, Dorepass, Munchas. The latter race are very superstitious, changing their place of residence at the slightest ill-omen, such as the death of a dog or a fowl. Their honesty is surprising: on quitting a temporary residence, if they have been unable to pay the government dues, they have been known to send the sum the next year.

The Bhíls are kind and affectionate fathers, and great faith may be attached to their word. Their simplicity is extraordinary; if any offender is seized, he not only confesses his fault, but any others he may have committed; and details his adventure with the most apparent *sang froid* and innocence, stating the names of his associates, be they friends or near relatives. The seizure of their women is one of the best means of bringing the husbands to terms.

There is little religion among them. They keep all feasts, Hindu and Mussulman, with equal zeal; and the most solemn form of oath is that of mixing salt, cowdung, and jowarree, and lifting up the mixture: this is called the meat gowree. If a Bhíl perjures himself on this oath he is deemed execrable, and abandoned by his caste.

No. III.—Consists of Extracts from Sir John Malcolm's Memoir on Central India, Vol. I., pp. 516, 517, 524, 526, 550, 576; Vol. II., pp. 155, 179, 450, 469.

No. IV.—Is a treaty between the East India Company and the Maharana Bheem Sing, of Oodeypore, concluded at Delhi on the 13th January, 1818, whereby the Maharana entrusted his dominion to the protection of the British Government. See Treaties, printed by Parliament, February, 1819, p. 38.

No. V.—Contains a statement of the dues levied by the Bhíl Pals between Oodeypore and Khairwarra, and a list of the Grasya Hill chiefs of Babul and Khairwarra.

Art. X.—*On the Hyssop of Scripture;* by J. Forbes Royle, M.D., F.R.S., L.S., *and* G.S., &c., *Professor of Materia Medica and Therapeutics, King's College, London.*

[*Read June* 15, 1844.]

When I lately had the honour of reading a paper before the Society, on the Mustard Tree of Scripture, I ventured to make some observations on what I considered to be the requisites for, and the best mode of pursuing, as well as upon what we should admit as proofs in, such enquiries. I proceed now to treat of another Biblical plant, which is not less interesting than the Mustard Tree to determine. This is the Hyssop, frequently mentioned in the Old, and twice independently in the New Testament, and which, if we are to judge by the numerous attempts which have been made to ascertain the particular plant that is meant, is not less difficult to determine, than any one of the several unascertained plants of the Bible.

That I may not seem to exaggerate what appeared to others the difficulties of ascertaining this plant, I will quote the commencement of the article on Hyssop of the learned and judicious Celsius: "De plantis plerisque in Hebræo Veteris Testamenti codice commemoratis, imprimisque de אזוב, recte pronuntiare, res est longe difficillima. Veritatem hic, si uspiam,

Scruposis sequimur vadis.
Fronte exile negotium,
Et dignum pueris putes.
Aggressis labor arduus,
Nec tractabile pondus est,

ut loqui amat Terentianus." It was not to Celsius alone that this appeared to be a difficulty; for he says farther on, "Aben Ezra, inter Ebræos commentatores facile princeps, suam ignorantiam, circa hanc stirpem, palam, et ingenue fatetur ad Exod. xii. 22;" and he thus translates the passage from the Hebrew of Aben Ezra: "*Quænam hæc sit plantarum, ignoro,*" "cætera, quanta est, Rabbinorum turba modo hanc, modo aliam conjectando, satis declarant, hujus plantæ notitiam sibi, Ebrææque genti periisse." Celsius Hierobotanicon, i. pp. 407 et 409.

Trusting that according to the acknowledged difficulties of the undertaking, so will be the indulgence accorded to any attempt to unravel its intricacies, I proceed, in the first instance, to adduce the passages in Scripture referring to Hyssop.

The first mention of Hyssop in the Old Testament, is immediately previous to the departure of the Israelites out of Egypt, and at the first institution of the Passover, when Moses called for all the elders of Israel and said unto them, (Exodus xii. 22,) "And ye shall take a bunch of *hyssop*, and dip it in the blood that is in the bason, and strike the lintel and the two side posts with the blood that is in the bason." From this passage it is evident that the plant must have been indigenous in Lower Egypt, and that it must have been sufficiently large and leafy, to be fit for sprinkling the door posts as directed. 2. The next notices of the hyssop are in Leviticus and in Numbers, which books having been written by Moses, indicate that the substances which he directs to be employed for sacrificial purposes, must have been procurable in the situations where the Israelites wandered, that is, in the countries between Lower Egypt and Palestine. Thus in the ceremony practised in declaring lepers to be clean, the priest is directed (Levit. xiv. 4) "to take for him that is to be cleansed, two birds alive and clean, and cedar wood, and scarlet, and *hyssop*." These are again all mentioned both in verse 6 and in verse 52. So in Numbers xix. 6, in the ceremony of burning the heifer and preparing the water of separation, the directions are: "And the priest shall take cedar wood, and *hyssop*, and scarlet, and cast it into the midst of the burning of the heifer;" and in verse 18, "That a clean person shall take *hyssop*, and dip it in the water, and sprinkle it upon the tent, and upon all the vessels, and upon the persons that were there," &c. Here we again see that the hyssop must have been large enough to be suitable for the purposes of sprinkling; that it must have been procurable on the outskirts of Palestine, probably in the plain of Moab. It is to this passage that the Apostle alludes in Hebrews ix. 19: "For when Moses had spoken every precept to all the people according to the law, he took the blood of calves, and of goats, with water and scarlet wool, and *hyssop*, and sprinkled both the book and all the people." In this passage we obtain no additional information, but as in the Septuagint the application of the Greek term ὕσσωπος as the equivalent of the Hebrew name *esof*. 3. The next passage where hyssop is mentioned in chronological order is in the beautiful psalm of David, where the royal penitent says (li. 2), "Wash me throughly from mine iniquity, and cleanse me from my sin;" and in verse 7, "Purge me with *hyssop*, and I shall be clean: wash me, and I shall be whiter than snow." This expression is considered by Bishop Horne (and also by others), in his Commentary on the Psalms, to refer to the rite described in the above passages, as the ceremony of sprinkling the unclean person with a bunch of "hyssop," dipped in the "water of separation."

But though the passage no doubt has a figurative signification, yet, with all due deference to such high authorities, the mode of expression is so direct, as to appear to me, as if the hyssop itself did possess, or was supposed to have some cleansing properties. If so, such might have led originally to its selection for the different ceremonies of purification, or such properties may have been ascribed to it in later ages, in consequence of its having been employed in such ceremonies. At all events, if the plant which we suppose to be the hyssop of Scripture can bear this signification, it will not be less appropriate. 4. The next notice of hyssop is in 1 Kings iv. 33, where in the account of the wisdom of Solomon it is said: "And he spake of trees, from the cedar tree that is in Lebanon even unto the hyssop that springeth out of the wall: he spake also of beasts, and of fowl, and of creeping things, and of fishes." In this passage we find that the plant which is alluded to by the name of *esob*, must also have grown upon a wall, though not necessarily to the exclusion of all other situations. Some commentators have inferred that the plant alluded to must have been one of the smallest, to contrast well with the cedar of Lebanon, and thus show the extent of the knowledge and wisdom of Solomon. But nothing of this kind appears in the text. The last passage which we have to adduce occurs in the New Testament, where in the crucifixion of our Saviour the Apostle John relates (xix. 29): "Now there was set a vessel full of vinegar: and they filled a sponge with vinegar and put it upon *hyssop*, and put it to his mouth." This passage has elicited the remarks of various critics, and inferences have been drawn respecting the nature of the plant, from the use to which it was applied. Others have observed, that the Evangelists Matthew and Mark, in relating the same circumstance, make no mention of the hyssop, but state that the sponge was put upon a *reed*, and given him to drink. The deductions which we may legitimately draw from the above passage are, that the hyssop was a plant of Judea, found indeed in the immediate neighbourhood of Jerusalem, and that it seems to have been used as a stick to which the sponge was fixed. If the plant which I suppose to be hyssop is calculated to answer this purpose, it will likewise answer for the elucidation of the parallel passages in the other Evangelists. Salmasius, as quoted by Celsius says: "Quodcunque feceris, et licet in omnia tete vertas, probabilem aliam verbis Evangelistæ explicationem adplicare non possis, præter eam, quæ ὕσσωπον pro calamo, vel virga hyssopi, cui alligata erat spongia Christo porrigenda, accipit. Ibi ὕσσωπον locum plane occupat καλάμου, cujus eandem ad rem usus apud alium Evangelistam."

Before proceeding to ascertain the particular plant which is alluded to, in the above passages, it is necessary to notice the name of hyssop in the Hebrew, as also those which were considered its synonymes in the several ancient versions of the Scriptures. For this information I am indebted chiefly to Celsius. The Hebrew name אֵזוֹב *esobh*, written also *esob* and *esof*, also by some *azub*, Celsius derives from a Hebrew root אזב: "Nempe Arabum ازب idem est, quod Hebr. זוב fluere, quo nostrum אזוב referri solet; ut ab aspergendo nomen acceperit." The Greek he derives from the Hebrew name: "ab אזוב *esob* derivandum esse Græcorum ὕσσωπον, unde Latini *hyssopum* habent, nulla est ratio, cur dubitemus, nam equidem frustra sunt, qui אזוב Ebræorum, et ὕσσωπον Græcorum, re et nomine differre volunt, ac in nominibus illis non esse nisi fortuitam soni vicinitatem; unde concludunt, haud esse necessarium, ut, quæ planta Ebræis est אזוב, sit omnino statuenda ὕσσωπος Græcorum; ex qua hypothesi tot diversæ plantæ ab unica אזוב in versionibus interpretum propullularunt." In this derivation agree Salmasius de Homonymis Hyles Iatricæ, p. 19, and Bochart Geogr. Sacr. 494, "duumviros reipublicæ literariæ clarissimos:" and Celsius adds, "Neminem puto fore tam morosum, ut etymi hujus veritatem in dubium vocare sustineat." Notwithstanding which, I cannot help thinking with the authors above alluded to, that the similarity in the sound of the two names is accidental, and has distracted the attention from other plants, to one which does not answer to all that is required. But it is quite possible that the name hyssop may in later times have been applied to the same plant, which at a certain period was indicated by the term esob or esof. Celsius further states, from Ovidius Montalbanus in Horto Botanigraphico, pp. 47 et 48, "Hyssopus Salomonica, que erumpit e pariete, Hebraice *esof*, et Chaldaice *esofa*." Also that according to Maimonides, Saadias, Kimchius, and Bartenora, אזוב *esob* of the Hebrews, is *satur* صتر of the Arabs. This is variously translated, *origanum*, *thymbra*, *satureia*, *serpyllum*, in different Lexicons; but *majorana*, *marum*, &c., "Talmudicis doctoribus," (Celsius, l. c. p. 409); while in the Persian version درمنه *diramne* is given as the synonym of esob, which is said by Castellus to refer to *Absinthium ponticum*. It is translated *muscus* in the Latin version of Junius Tremellius; in that of Piscator, *libanotis* v. *Ros marinus; Origanum* in dissertations of Anguillaria, &c. "His adde ὑσσὶν, et ὑσσωτὸν et οἴσυπον, quæ in Evangelista Johanne pro *hyssopo* legenda, superioris ævi Aristarchi censuerunt. Sed non raro *interpretum conjecturæ*, ut ait Cicero, *magis ingenia eorum, quam vim consensumque naturæ declarant.*" Celsius, l. c. p. 410.

The several plants which have been considered by different authors to be the Hyssop of Scripture, are enumerated by Celsius under eighteen different heads. These we shall group together according to their natural affinities.

1. Adiantum Capillus Veneris, or Maidenhair, a native of South Europe and of the East, is adduced as the hyssop of Solomon, by Lemnius, but he thinks that this is distinct from the hyssop of the other passages of Scripture: "Quoniam itaque exiguus est, atque e parietinis erumpit, hunc pro Hysopo designari arbitror." (Herb. Bibl. Expl. p. 68.)

2. Asplenium Ruta muraria, L., or Wall Rue, formerly called Salva Vitæ, or Salvia Vitæ, common in the fissures of rocks in Europe, is adduced by Deodatus in the notes to the Italian version. Both of these are of the class of Ferns.

3. Tremellius, adopting in some measure the opinion of Lemnius, yet translates *esob* by *muscus*, and considers Polytrichum commune, or common Hair Moss, found both in Asia and Europe, to be the plant.

4. Ovid. Montalbanus (in Horto Botanigraphico, pp. 47 et 48), conceives, in a passage quoted by Celsius, that *esob* is the small plant called *klosterhysops* in German, and which Celsius ascertained to be the Alsine pusilla, graminea, flore tetrapetalo, of Tournefort, Sagina procumbens, L., or Procumbent Pearlwort, a native of Europe in sterile and moist fields, of the natural family of Caryophylleæ.

Of the tribe of Compositæ, and genus Artemisia, two species have been thought to be hyssop. 5. Abreta or Abrotonum. "Joh. Mercerus, profundæ in Hebraicis doctrinæ vir, existimabat (*Abratham*) esse Græcorum, et Romanorum Abrotonum." This is the Artemisia abrotonum, L., or Southernwood, a native of the South of Europe and of Asia Minor, and which was, according to Celsius, thought to be the hyssop, by some of the Hebrew doctors. Casaubon remarks that it was probably this kind of hyssop which was given with the sponge and vinegar. "Idque eo consilio, ut potionem Domino pararent penitus amaram, penitus ingratam." 6. Artemisia Pontica (including probably also A. Judaica), a native of the South of Europe, Syria, and Central Asia, "unde semen contra vermes colligitur et ex Chorasan deportatur Halebum;" It. *Seme santo*, Lat. sementina, is adduced by Castellus as a translation of the *Diramne* which occurs in the Persian version, but which is usually translated Thymbra, *Satureia Thymbra*.

The majority of plants which have been adduced as the hyssop of Scripture belong to the natural family of Labiatæ, of which many species "are known for their uses in seasoning food, as thyme, sage, savory, marjoram, and mint, while others, as lavender and rosemary, are more celebrated for their uses as perfumes. Many of these having been described in the works of the ancients, have found their way into those of the Asiatics, where Lavandula stæchas may be found under the name *oostakhoodus;* rosemary under *ukleel ool-jibbul;* thyme as *hasha;* hyssop, *zoofae yabis*; basil, *rihan;* marjoram, *satur;* mint, *nana;* and sage under the names *salbiah* and *sefakus*, which last are evident corruptions of *salvia* and *elisphacos*." (Illustr. Himal. Bot. p. 302.)

The several plants of the family of Labiatæ which have been adduced by different authors, are as follow,—

7. Prosper Alpinus figures as Hyssopus Græcorum, a plant he describes as "plantam nobilissimam," having grown it from seeds obtained from Crete, and "Origano Oniti" (pot-marjoram) "adprime similem, esse legitimum hyssopum visum est."

8. Some of the Hebrews (v. Celsius) call a plant *esob javan*, which by the Arabs is called *istuchudus*, and of which the leaves resemble the plant called *zatar* (v. infra). The Arabic name is probably a corruption of Stæchas, which is Lavandula Stæchas, L.; a plant found in the Mediterranean region.

9. Rosmarinus officinalis, or common Rosemary, a native of the Mediterranean region, and which may perhaps be found in Palestine: "Quod in Galilea etiam frequens sit, auctoribus Radzivilio et P. Dappero." (Cels. l. c. p. 418.) Some of the older authors have selected this plant, because being a shrubby species, a stick might easily be obtained, to which the sponge dipped in vinegar could have been tied. It is suitable also for sprinkling.

10. Origanum Majorana, *Σάμψυχον* of the Greeks, and *schomschok* of the Talmud, was considered to be the hyssop by Pena and Lobel. (Stirp. Advers. p. 212.) It is doubtful whether this be not Origanum Onites. (Spr. ii. 507.)

11. Mentha, or a species of mint, is adduced in the Ethiopic version.

12. Mentha Pulegium, another species of the same genus, the *γλήχων* of the Greeks, and *foodnuj* of the Arabs, and *siah* of the Talmud.

13. Teucrium Polium, or Teucrium pseudohyssopum, *Schreb.* a native of the Mediterranean region, and found by Bové in the desert of Sinai, is brought forward by Columna, not only as the hyssop of the Greeks and Romans, "sed ipsius quoque Mosis et Salomonis veram et genuinam hyssopum."

14. Thymus serpyllum, or common Thyme, widely diffused in mountainous situations in Europe and Northern Asia; *hasha* of the Arabs, and קודניף Talmudicis. Cels. l. c. p. 423.

15. In the Arabic version of the Books of Moses, *esob* is translated by صعتر *satur* or *zatur* of the Arabs, *zitri* of Talmudical writers; the Arabic name is considered by them to be synonymous with ὀρίγανος of the Greeks, supposed to be Origanum heracleoticum, L., but several different species or varieties are included under the Arabic name *satur*, which it is needless here to inquire into, as they are all similar in nature and properties.

Some other names, as, 16. Hyssopus cochaliensis, and, 17. Marum album, Maruchivara Talmudicis, are adduced by Celsius, pp. 416 et 419, which I have not yet traced. Sibthorp (Fl. Græca, i. pp. 596, 597,) mentions that in Greece the name ὑσσώπος is applied both to Satureia græca and to S. juliana. He himself conjectures that Thymbra spicata may be the ὕσσωπον ὀρεινην of Dioscorides. Thymbra verticillata, L., was similarly adduced by Dalechamp.

The only plant which remains of those adduced by Celsius is, 18. the common or garden Hyssop, Hyssopus officinalis of botanists, which is supported by Celsius himself. It has had the greatest number of suffrages, apparently from the similarity of name. This may or may not be accidental. It is in the first place desirable to know, not only whether the *esob* of the Hebrews, the ὑσσώπος of the Greeks, and the *hyssopus* of the Romans, was the same plant, but also whether what we now call hyssop is the same plant as any one of these. Of this, I believe, with Sprengel, and others, there is no proof.

The account given of the hyssop by Dioscorides is so imperfect, that we have no points of comparison given in the article on this plant. But in describing οριγανον, (*Origanum heracleoticum*), the leaves are described as being similar to those of hyssop, but that its umbel is not rotate, as if he wished to indicate that such was the inflorescence of the hyssop. In the chapter on Chrysocoma it is said that it has a corymboid coma, like the hyssop. Nicander moreover has stated that the hyssop is like marjoram (σαμψύχον) and the Arab Isaac Ebn Amram compares zoofa (زوفا) with marjoram. Besides this, Dioscorides mentions that there are two kinds, one mountain, and the other garden hyssop, and that the best is produced in Cilicia; Pliny adds "in Pamphylium et Smyrneum." The Arab authors, Abu'l Fadli and Al-Olaji, as quoted by Celsius, also mention two kinds, the mountain and the garden. In the Talmud authors, that which is found in the desert is distinguished from the garden kind. Maimonides, as quoted by Celsius, says: "Hyssopi multæ sunt species, in legem autem hæc qua homines plerumque utuntur in cibum, quam nos melle condire solemus." That it was employed by the Greeks and Romans as a condiment is evident from its mention by Apicius; others describe it as bitter and fragrant; Dioscorides mentions only the diseases in which it is useful.

The modern hyssop (Hyssopus officinalis, L. Sp. 796) belongs to a genus of which itself is the only species. It is a perennial plant, usually very smooth; (but a variety is described by De Candolle, in the Flore Française, Suppl. 396, which he calls H. canescens, from its being covered with short rigid hairs.) The root throws up several leafy stems, which are woody at the base, diffuse and much branched. The branches are from one to two feet in length. The leaves are opposite, sessile, rather thick in texture, narrow, linear, lanceolate, in one variety elliptical; margins very entire, flat, or subrevolute; green on both sides; below, one-nerved; held up to the light and looked at with a magnifying glass, they seem to be obscurely dotted. The flowers, of a bluish or reddish colour, are arranged *along one side* of the stem in closely approximated whorls in a *terminal spike*. The floral leaves are similar to those of the stem, but smaller. Bracts lanceolate, linear, acute. The calyx is tubular, fifteen-nerved, with five equal teeth, with the throat naked. The corolla, of a reddish-purple colour, with its tube equalling the calyx, is bilabiate, with its upper lip erect, flat, and emarginate; the lower one spreading and trifid, middle lobe largest; stamens four, exserted, didynamous, diverging; the lower ones the longest; anthers two-celled; cells linear, divaricate; style nearly equally bifid at the apex; lobes subulate, with the stigmas at the apex. The four achenia (or seeds with their coverings) ovoid, three-cornered, compressed, and rather smooth.

The localities of the hyssop, as given by Mr. Bentham, the latest and most accurate author on the family (Labiatæ) to which it belongs, are as follow: "Hab. in Europa australiori et Asia media; in Hispania [*Pavon*], Gallia australi, Italia, Germania australi, rarior in Germania media [*Reichenbach*], in Belgio [*Dumortier*], in Rossia meridionali [*Prescott*], in Tauria et Caucaso in Jugo Altaico [*Bunge*]." M. Bové mentions a hyssopus within three leagues of Jerusalem, and the rosemary. I myself have obtained it, and the specimens have been examined by Mr. Bentham, from Kanum and the Ganthung Pass in Kunawur, a tract along the Sutledge on the northern face of the Himalayan Mountains, and which may be considered a part of Tibet.

The hyssop is remarkable for its fragrant and aromatic properties, hence its employment as a condiment and a sweet herb, and as a moderate excitant in medicine: to it, however, many other virtues were formerly ascribed.

Of all those plants, we need only say, as Celsius has already done respecting a plant which he thought to be less eligible than what is commonly known by the name of hyssop, "Nam postmodo, ubi de vera hyssopo aliqua dicenda erunt, Abrotonum cum reliquis, hyssopi umbris, uno falculæ ictu succidetur."

The plants adduced by the latest writers are, 1st, Phytolacca decandra, by Mr. Kitto in the Pictorial Bible in Exod. xii. 22. "The hyssop of the Sacred Scriptures has opened a wide field for conjecture, but in no instance has any plant been suggested, that at the same time had a sufficient length of stem to answer the purpose of a wand or pole, and such detergent or cleansing properties, as to render it a fit emblem for purification. Our wood-cut represents a shrub remarkable in both these respects, which is the *Phytolacca decandra.*" Rosenmüller says, the Hebrew word esobh does not denote our hyssop, but an aromatic plant resembling it, the *wild marjoram,* which the Germans call *dosten* or *wohlgemuth,* the Arabs *zater,* and the Greeks *origanon.*

Dr. Robinson, in the ascent of Jebel Musa by himself and Mr. Smith, says: "In all this part of the mountains were great quantities of the fragrant plant *ja'deh,* which the monks call hyssop," (Bibl. Res. i. p. 157); and on the ascent of St. Catherine, "The ja'deh or hyssop was here in great plenty; and especially the fragrant *za'ter,* a species of thyme, (Thymus serpyllum of Forskal,)" p. 162. Lady Calcott suggests that the hyssop of aspersion was hyssop tied to a stick of cedar. Winer, (Biblisches Real Wörterbuch, ii. p. 820,) admits the same plant as Rosenmüller, but considers that several plants were included under the name esobh; and concludes his observations on Ysop by saying: "We must, however, wait for more accurate observations upon the species of hyssop and origanum indigenous in Western Asia, before the meaning of the Hebrew *esobh* can be finally settled."

My attention was first directed to the subject when lately collating the list of drugs in the Latin edition of Rhases, with those in my own MS. Catalogue before alluded to. It is stated in that work, as indeed in that of Dioscorides, c., that there are two kinds of hyssop, the one a garden, the other a mountain plant; but Rhases further adds, that the latter is found on the mountain of the Temple, that is, of Jerusalem: "est herba quæ oritur in montibus Templi, folia ut majorana. Sylvestri montanus fortior, et dicitur 'ysopus altaris.'" These two kinds are also noted by Celsius as "Hyssopus in montibus Hierosolymorum, زوفا بجبال القدس zoofa bu jibal al kuds," and "Hyssopus sicca, زوفا يابس zoofa yabis." Jerusalem is now called by the Arabs *El-kuds,* "the Holy," and also by Arabian writers *Beit-el-*

Mukdis or *Beit-el-Mukaddas*, the Sanctuary, &c. (Robinson's Biblica Researches, i. p. 380.) Rhases again, in the article Epithymum (Cuscuta or Dodder), says of it: "Caret radice sed suspendit supra arborem ysopi magni et folia ysopi colligitur cum eo; et fit in montibus Templi." So Serapion, quoting Aben Mesuai, says of it: "Ex Creta ac domo sancta, allatum;" and of the hyssop, he quotes Isaac Eben Amram as saying, "Laudatissima, ex domus sanctæ montibus." Whether these expressions refer to the common hyssop, or to that which we conceive to be the true plant, it is not easy to determine, as the accounts are confused. But the large size of one kind indicates that it must have been a very different plant from the common hyssop. One troublesome circumstance is, that the translators of these Arabic works do not always adhere to the arrangement of their authors, as they sometimes convert the arrangement according to the Arabic alphabet, into one according to the Latin names and the Roman alphabet. Thus in the great work of Rhases called Hawi, or "Continens," hyssop is described under the letter sin, and the name in the Latin translation is written ysopus, but in his work Ad Mansor, we have hyssop under the letter "Ze id est Z," and two kinds mentioned, one called "Cyfe, id est, hyssopus quæ vegetatur," and the other written "Œsypus autem humida, quæ et cerotes dicitur, quæ ex lanæ sordibus fit." These two varieties refer to the زوفا يابس *zoofa yabis* or *khooshk*, that is, dry hyssop, and the other to زوفا رطب *zoofa ratub*, Lana succida, *οἴσυπος* of Diosc. l. c. 54. N. 88. l. Ar. c. 384.[1] Here we have very clear evidence, that two very different things have been treated of under one name, apparently only because the Greek names are a little similar. Hence it is not impossible but that similar confusion may have taken place with the Greek ὕσσωπος, hyssopus, and an oriental name like the Hebrew [illegible] or [illegible].

Having suspected the existence of a plant distinct from the hyssop, I was led to what appears to me its discovery, by a passage from Burckhardt's Travels in Syria, quoted by Mr. Kitto in his work entitled The Physical Geography and Natural History of the Holy Land, p. cciii: "Among trees and shrubs known only by native names and imperfect descriptions: The aszef is spoken of this month by Burckhardt while travelling in the Sinai Peninsula. On noticing its presence in Wady Kheysey, he describes it as a tree which he had already seen in several other wadys. It springs from the fissures in the rocks and its crooked stem creeps up the mountain side like a parasitical plant. According to the Arabs it produces a fruit of the size of the walnut, of a blackish colour, and very sweet to the taste.

The bark of the tree is white, and the branches are thickly covered with small thorns; the leaves are heart-shaped, and of the same shade of green, as those of the oak. (Syria, 536, 537.)"

The above description, though apparently incorrect in the application of some terms, as that of *tree*, to a plant creeping like a parasitical plant, yet will strike most botanists, as a characteristic description of the Common Caper Bush, which is indigenous in these regions, and which I was aware had an Arabic name, in sound something like the *aszef* of Burckhardt. The caper plant is one of those which in the copious language of the Arabs has more than one name. It is well known that its most common name is كبر *kibbur* or *kubar*. From this the Greek *κάππαρις*, and the Latin *capparis*, appear to have been derived. In referring to one of the Persian works on Materia Medica, which has been published with an English translation by Mr. Gladwin, that is, the Ulfaz Udwiyeh, we are referred from capers in the Index to Nos. 1271. 175 and 184. The first of these is كبر or capers, the second is اصل الكبر *ussul ul kubir*, root of the caper bush. No. 184 is another name for the same thing, اصل الاصف *usul al ásuf*, as it is translated, root of the caper bush. We may learn also from other sources, that *asuf* is one of the names of the caper bush. Thus in the Kamus, or Great Arabic Dictionary, *asuf* is *al kubber*. So also in Freytag's Lexicon Arabico-Latinum, *asuf* is translated *capparis*; likewise in Richardson's Persian, Arabic, and English Dictionary, London, 1829, and in Shakespear's Hindustani Dictionary, we have اصف *asuf*, "the caper tree or root." That this has long been known to be one of the names of the caper plant is evident from Mentzel's Index Nominum Plantarum Multilinguis; where we have *alasif* given as an Arabic name of *capparis*, taken from the Index of Avicenna, editio Veneta, 1564. fol. I quote this, as I am unable to find the word in my own copy of Avicenna, Venice, 1555. It appears to be a corruption of *alasif* that Forskal heard applied to the caper plant which he found at Taas near Mocha, as a shrub growing out of a wall (Flora Ægyptiaco-Arabica), and of which he says, "Si hæc vera est Capparis spinosa, competit illi nomen Arab. Lasaf, لصف." This may be a corruption of الاصف, or Forskal may have written it simply اصف *asuf*, and the mere junction of the letters would convert it into لصف *lasuf*, a mistake which might easily be made even by the celebrated Niebuhr, as he published the work from Forskal's notes after his death. In my own MS. Materia Medica, *asuf* is given as a synonym of *kibbur*, with *kifarus*, as the Yoonanee or Greek name, which is evidently intended for *κἄππαρις*, as the letter *p* is wanting in the Arabic alphabet.

The similarity in sound between the *asuf* of the Arabs and the *esof* of the Hebrews, cannot fail to strike every one, and this similarity would extend equally to the writing of the two names in the language of the other. A less degree of similarity has in other cases of Hebrew and Arabic names, been considered to indicate identity of origin in words in these two languages. This similarity might certainly be accidental, but it cannot be accidental that the plant called *asuf* by the Arabs, answers to every particular which is required for the due elucidation, not of one, but of every passage of the Bible in which *esof* is mentioned. This we shall proceed, we hope satisfactorily, to prove.

First with respect to its geographical distribution, the *asuf* like the *esof* ought to be found in Lower Egypt, in the Desert or country between the Red Sea and Palestine, and also in Palestine itself.

The Caper plant, *Capparis spinosa* of Linnæus and of all modern botanists, is well known to be abundant in the south of Europe, where it appears to be indigenous. It is found also in the islands of the Mediterranean and generally on the coasts of that sea, the Mediterranean region, of botanists. It is specifically mentioned as found in Lower Egypt, by Forskal in his Flora Ægypt.-Arab. as *Capparis spinosa*, called *kabbar* by the Arabs, growing wild in the neighbourhood of Alexandria. The same facts are stated by De Lile, in his Illustratio Fl. Ægypt. pp. 8 and 16, forming the botanical portion of the great French work on Egypt. Previous to these authorities, Prosper Alpinus had stated that the capers of Alexandria were larger than those of other places: "Capparis Alexandriæ majores quam alibi inveniantur proveniunt, quos *cappar* quoque appellant." (De Pl. Ægypti, p. 60.) So Pliny, "Likewise in Ægypt groweth capparis, a shrub of a harder and more woody substance: well known for the seed and fruit that it carrieth, commonly eaten with meats, and for the most part the capres and the stalke are plucked and gathered together. The outlandish capres (not growing in Ægypt) we must take good heed of and beware: for those of Arabia be pestilentiall and venomous: they of Africke be hurtful to the gumbs, and principally the Marmarike are enemies to the matrice, and breed ventosities. The Apulian capres cause vomit, and make lubricite both of stomack and bellie. Some call the shrub cynosbatos: others ophiostphayla." (Holland's Translation, lib. xiii. c. xxiii.) So in Av. c. 141, capparis is called *kabar* in the margin, with a reference to Diosc. 2. c. 166, "quædam est species, quæ e Rubro Mari defertur."

In Lower Egypt is also found another species, first discovered by Lippi, the *Capparis Ægyptia* of Lamarck. It is figured by De Lile, Fl. Æg. p. 93. t. 31. f. 3, and described by him as a spreading shrub, of which the branches are slender but firm; it grows in the mountains of the desert opposite Minyeh. This species was also found by M. Bové, and by Aucher-Eloy, in the desert in the neighbourhood of Suez.

In the deserts and tract of country in which the Israelites wandered, the caper plant, or some of the species of capparis resembling it in general appearance, are no doubt found in many places. The notices of it, however, are few, but the localities are so widely separated that we are warranted in considering that it might be found in many intermediate situations; and it would be so by competent travellers, that is, by those having some knowledge of Natural History.

From the description of Burckhardt already quoted, in which he saw the *aszef* in the Sinai Peninsula, springing from the fissures of rocks, with its crooked stem creeping up the mountain side like a parasitical plant, with a white bark and the branches thickly covered with small thorns, and heart-shaped leaves,—there can be little doubt of this being a species of capparis, and probably the caper plant. It is interesting to observe that he mentions it as a plant which he had already seen in several other wadys. We have however very definite information respecting the caper plant in this situation, as M. Bové, in his "Relation d'un Voyage Botanique en Egypte, dans les trois Arabies, en Palestine et en Syrie," (Ann. des Sc. Nat. i. p. 72,) says: "Le mont Sainte Catherine est au sud-sud-ouest du mont Sinaï. Dans les déserts qui environnent ces montagnes j'ai trouvé *Capparis spinosa*, &c." Belon (Obs. ii. c. xxi.) mentions "Capparis non spinosa—minores enim in Capparum stirpibus spinosis nascuntur . . . ," and at c. LX. "Per istos colles oberrantes, cappares invenimus, pumilarum ficuum altitudinem æquantes,—semina instar piperis calida." So Dr. Shaw, "Capparis Arabica, fructu ovi magnitudine, semine piperis instar acri." Belon. Obs. l. ii. c. 60. "Nostra tricubitalis est. Folia habet glauca, crassa, succulenta, rotunda, uncialia, Fructus, quem vidi, pollicis fuit magnitudine, oblongus cucumeris forma, quem Arabes appellant Filfal jibbel, *i. e.* Piper montanum. Copiose crescit in via ad montem Sinai." (Travels, vol. ii. p. 355.) More to the eastward we have no distinct notices of the true caper plant, but other species are found, as C. heteracantha and C. leucophylla, between Aleppo and Bagdad by Olivier. (D.C. Sp. 12 et 13.) So Aucher-Eloy mentions the banks of the Tigris as covered with "la plus vigoureuse végétation;" that is, with Tamarix, Salix, Capparis leucophylla. If we trace it to the southward, we have already mentioned, that Forskal found it as a small shrub growing out of a wall near Taas in the neighbourhood of Mocha. Dr. Falconer, late Superintendent of the East India Company's Botanical Garden at Saharunpore, has informed me that when at Aden on his way home, he saw the rocks there covered with a species of capparis, which appeared very like the common caper. A species very similar to it is also among the plants collected by Lieutenant Wellsted in the island of Socotra.

We have, thirdly, to find the caper indigenous in Palestine and Syria. This there would be no difficulty in doing, if travellers took the trouble of noting the vegetation of a country, as one of the features which distinguish its physical geography. Some omit all notice of common plants. Others notice a plant only when first met with. Mr. Kitto, who has made an abstract of nearly all the natural history information of most of the travellers in the Holy Land, mentions the caper, only in the fields near Aleppo, as observed by Dr. Russel. M. Aucher-Eloy mentions a species of capparis (C. effusa) in the neighbourhood of Mount Tabor. Dr. Clarke found "Capparis spinosa, common caper tree, at Cyprus, and in the Holy Land (Jaffa)." M. Bové, entering Palestine from Egypt, mentions on his arrival at Gaza, "Au nombre des plantes spontanées, je citerai les suivantes: *Capparis spinosa.*" Again, on his arrival at Jerusalem, he says, (l. c. p. 173,) "Dans les ruines croissent les Rhus coriaria, l'Hyoscyamus coriaria, le Momordica Elaterium, et le *Capparis spinosa.*" Belon had previously mentioned finding the caper plant in the vicinity of Jerusalem. (*v.* Rauwolf, p. 269.)

In the above references we have ample proofs of the caper plant, or *asuf*, being found in all the situations where the *esof* is mentioned in the Bible. That it grows out of the fissures of rocks, and the ruins of buildings is evident from some of the above extracts. Thus De Candolle gives as its habitat, " In muris et rupestribus Europæ australis et orientis." When at Aleppo, Rauwolf says (Travels, p. 49), "There grew also in the road and on old walls such plenty of capers, that they are not at all esteemed; they take these flowers before they open, and pickle them, and eat them for sauce with their meat;" and again, at p. 75, "and near it in old decayed brick-walls and stony places." So Ray, (Hist. Plant. p. 1629,) " Locis arenosis et ruderatis gaudet. Nos in muris et ruderibus Romæ, Senarum, Florentiæ et alibi in Italia observavimus spontaneam; cultam circa Tolonam in Gallo-provincia, ad muros et macerias."

We proceed now to show that capers were supposed to be possessed of cleansing properties. This is evident from the following quotations. Thus Murray (Apparatus Medicaminum, ii. p. 381,) in summing up the account of its uses as given by the ancients, says: "Et quæ veteres, quibus insigni in pretio fuit, de eo recensent, ad aperiendi vim potissimum et abstergendi pertinent. Nempe precipue in obstructionibus lienis, in mensium suppressione, malo ischiadico, in strumis discutiendis, porro in ulceribus expurgandis, præceperunt. Diosc. Mat. Med. lib. ii. cap. 204. Galen de Simpl. l. 7. Plin. Hist. Nat. lib. 20. cap. 15."

Dr. Alston (Mat. Med. i. p. 371,) observes, "Hippocrates even orders it as a detergent in peripneumonia. 'Postquam autem purum esse sputum cæperit ari concham majorem et sesamum . . . Quod si magis educere voles radicis capparis corticem his admisceto.' De Morb. l. iii. p. 493. lin. 23."

Pliny, who exhausted all the sources of information to give us in his Natural History, a view of the knowledge of his times, has a curious observation on the utility of the root of capers in a disease closely allied to leprosy, the complaint in which *esof* was employed by the Israelites. Thus in the translation of Holland, we learn that "The root of capres is singular good to take away the white spotted morphew, (cousin germane to the leprosie,) in case it be stamped, and the place affected rubbed therewith. Take the rind of the root, the quantitie of two drams, and drinke it in wine, it helpeth the swelled splene; provided alwaies that the patient forbeare the use of baines and hot-houses: for (by report) this course continued 35 daies will cause the said splene to purge away, partly by urine and partly by seege. The same, if it be taken in drinke, allaieth paine in the loins and cureth the palsey. The seed of capers sodden in vinegre, brused and applied to the teeth, or otherwise the root thereof chewed only, assuageth the tooth-ach. A decoction of capers in oile, instilled into the ears, mitigateth their paines. The leaves and the root newly gathered, and so applied as a cataplasme with honey, healeth the corrosive ulcers that eat to the very bone. Likewise the root resolveth all those glandular swellings which wee call the King's evill: and if the same be sodden in water, it discusseth the tumors behind the ears, and riddeth away the wormes breeding within. It cureth also the infirmities of the liver. The manner is to give the same in vinegre and honey for to chase away the vermin engendered within the guts. Boiled in vinegre, it is singular for the cankers or ulcerations within the mouth; howbeit, all authors doe accord, that they be not good for the stomacke." 20 Book. ch. xv.

In modern works which have derived much of their information from the more ancient, we find it noticed, even in a botanical work, that "Les capriers excitent l'appétit, et sont regardés comme apéritives, antiscorbutiques, et propre pour tuer les vers. L'écorce de la racine est apéritive, diurétique et emmenagogue." Lamarck. Encycl. Botanique, art. *Caprier.*

So capers formed one of the "Quinque radices aperientes minores," or the five lesser aperient roots, as Caper, Dandelion, Eryngo, Madder, and Restharrow. It still holds a place in some of the German Pharmacopœias as well as in the Spanish, and continues to be employed throughout Eastern countries, where old remedies still enjoy their pristine repute. In Europe, it is now almost universally known as a condiment, its unexpanded flower-buds being preserved in vinegar.

It remains only to consider whether the caper plant is suitable to the passage of the New Testament in which the hyssop is mentioned, and it appears to me, that it is as well so, as any other that has been proposed.

The passage in which hyssop is mentioned has been much commented on, in consequence of the difficulty which commentators have experienced in finding a plant which should answer in all points to what is required. Thus it is said, John xix. 29, *Σκεῦος οὖν εκειτο οξους μεστον· Οἱ δε πλησαντες σπογγον οξους, και ὑσσωπῳ περιθεντες, προσηνεγκαν αυτοῦ τῷ στοματι*, or as translated in the authorized version. "Now there was set a vessel full of vinegar, and they filled a sponge with vinegar, and put it upon hyssop (*fixing it on a hyssop stalk* of some) and put it to his mouth." One difficulty has arisen from the evangelists Matthew and Mark, in describing the same occurrence, making no mention of the hyssop. Thus Matthew (xxvii. 48,) describes one, as bringing a sponge, *πλησας τε οξους, και περεθεις καλαμῳ*, and they "filled it with vinegar and put it on a reed, and gave him to drink." Mark (xv. 36,) in like manner writes, *και γεμισας σπογγον οξους, περεθεις τε καλαμῳ* "and one filling a sponge with vinegar, and placing it about a reed, gave him to drink."

In all the three accounts we have the sponge filled with vinegar, and given to our Saviour to drink; Matthew and Mark stating it, as being raised on a reed, while John omits all mention of the reed, but describes the sponge as being put on or about hyssop. By some commentators it has been supposed that the sponge and hyssop were fixed to a reed or stick, and that one evangelist has omitted all notice of the latter, and the two other evangelists of the hyssop. Other commentators argue, that in the relation of the same circumstances by these witnesses, it is evident that the reed or stick must be the same as a stick of hyssop. As John is the more particular in his description and usually supplies what has been omitted in the other accounts of our Saviour, and as he expressly states, xix. 35, "And he that saw it bare record, and his record is true," so are we bound to make our explanation suit his description.

The difficulty has been to find a plant fitted for the purpose and to which the name hyssop was applied; for it is acknowledged on all hands that the common hyssop is too short and too slender to be used as a stick. Some commentators therefore have proceeded so far as to suggest alterations in the text. Thus Camerarius for ὑσσώπῳ proposes ὑσσῷ, *pilo vel veruto*, "javelin or dart." Heinsius suggests ὑσσωτῷ, *asta*, "a spear or pike," and also οἴσυπος, *lana succida, vel sordida;* as the words ὕσσωπον and οἴσυπον are often confounded by others as well as by Arab authors, "multis locis apud auctores tam Græcos, quam Latinos, errore scribarum esse permutatas." (Celsius. l. c. p. 444.) Bochart again, retaining the name, has proposed changing the case of hyssop, "et pro ὑσσώπῳ legendum censuit ὕσσωπον. Quasi vellet Johannes: περιθεντες ὕσσωπον σπόγγῳ, posuerunt hyssopum circa spongiam: quæ explicatio est violenta; contraria vero maxime naturalis, cum sponte se offerat accusativus σπόγγον ex ingenio linguæ, et phraseos, hic subintelligendus, et repetendus, ut sit: περιθέντες (σπόγγον) ὑσσώπῳ, *i. e.* περὶ ὕσσωπον, quomodo Græci nonnunquam loquuntur." Celsius. l. c. p. 445.

Instead of supposing as in the above instance, that the hyssop was placed round the sponge, Celsius himself is of opinion that the sponge was filled with vinegar, and that to it was tied a bundle of hyssop, which might thus be contained in its middle when it was reached up to our Saviour. He further adduces Casaubon and others as agreeing with this explanation, as well as with the Ethiopic version, where we read, "Et erat ibi vas aceto plenum, et impleverunt spongiam aceto, ac foliis hyssopi, et ligarunt super arundinem."

But all these explanations and interpretations are variations from the plain and obvious meaning of the passage of St. John in which the sponge filled with vinegar is described as being put upon hyssop, that is, a stick of hyssop, and raised to our Saviour on the Cross. The difficulties experienced have arisen from the common hyssop, which is generally supposed to be the plant alluded to, not being suited for the purpose. But we have already seen that the common hyssop does not answer in any respect to what is required. The caper plant, which we have seen exactly appropriate to so many of the passages, seems also well suited to the present, as it will yield a stick large enough for the purpose. And this is required by some of the versions, as the old Italian, *un basto e d'hissopo:* likewise in the Spanish, and in the

French edition of Montensi, *au bout d'un baton d'hyssope.* So also in that of many celebrated men.

Some also of the ancient statements refer evidently to a larger plant than the common hyssop. Thus Josephus, (Antiq. lib. viii. cap. 2,) ranks it with trees. By the Rabbins it was included among woods, "hyssopum inter ligna censeri apud Rabbinos." Tract Shebiit, c. viii. § 1. Parah, c. xi. § 8. So in Tract. Succah, fol. xiii. 1, "inter mentionem cannarum, et surculorum, quibus obtexerunt Judæi tentoria in festo tabernaculorum memorari etiam hyssopum." (Celsius. Hierobot. 439—442.) It is more than probable that the *asuf*, or caper plant, is the *esob* or *esof* referred to in these passages, and Winer says, "Truly it cannot be concealed, that the Talmudists distinguish the hyssop of the Greeks and Romans from the *esobh* of the Law." Biblisches Real Wörterbuch. ii. p. 820.

The height of a shrub which would be fitted for such a purpose may be judged of, by what must have been the fact, that the Cross of our Saviour could not have been higher than what any man of moderate stature might, with an ordinary stick and his arm stretched out, easily reach the mouth of our Saviour. For it is evident that the cross to be of sufficient strength and yet carried by a man, could not also be very lofty.

For such a purpose it is evident that no large tree is required, because a shrub of moderate dimensions would easily yield a stick of three or four feet in length; and such any of the old caper bushes or trees, as they are sometimes called, growing in the congenial climate of Palestine, would be able to supply. "Ibi, [that is, in Egypt] et capparis firmioris ligni frutex." Plin. xiii. c. 23. The prickly nature of the stem, moreover, would better fit it for the purpose of having the sponge affixed to it. The caper plant was not only a plant growing wild on the rocks and walls of Jerusalem, no doubt, in ancient times as at the present time, but one which seems from the earliest times to have been valued as a medicine, and its flower-buds employed as an article of diet, or rather as a condiment. If it was allowed to hazard a conjecture, we might say that a notched stick, or a cleft reed, might have been employed in gathering the caper buds from off the extremities of the branches, and to this, the name of hyssop stick might correctly be applied. This employment of capers is further interesting as explaining in some measure the presence of the vessel full of vinegar (*οξους μεστον*). The word *οξος*, which is translated "vinegar" in the English version, and *acetum* in the Latin, is sometimes translated "sour wine," and is supposed to have been there for the refreshment of soldiers. It may have been so; but it is curious that vinegar, (which was also called *οξος* by the Greeks, as we may see in a nearly contemporary author, that is, Dioscorides, lib. v. c. xxii, *περι οξους*,) should have been required for preserving different parts of the caper plant in those days as at the present time. For we learn from Pliny, who says of fruits eaten, "In fruticoso genere, cum caule capparis," lib. xv. c. 28. Again, xiii. c. 28. "Ibi et capparis, firmioris ligni frutex, seminisque et cibi vulgati caule quoque una plerumque decerpto." "Likewise in Egypt groweth capparis, a shrub of a harder and more woodie substance: well knowne for the seed and fruit that it carrieth, commonly eaten with meats, and for the most part the capers and the stalke are plucked and gathered together." (Holland's Pliny, xiii. c. 23, and in other places.) "Tritum ex aceto semen decoctiam," &c. "The seed of capres sodden in vinegre, bruised and applied to the teeth, &c. It cureth also the infirmities of the liver. The manner is to give the same in vinegre and honey. Boiled in vinegre, it is singular for the cankers or exulcerations within the mouth." (Lib. xx. c. 15.) The caper plant, though wild in so many parts of the Roman Empire, was yet cultivated even in that age. "Quippe cum capparis quoque seratur, siccis maxime, area in defossu cavata, ripisque undique circumstructis lapide: alias evagatur per agros et cogit solum sterilescere. Floret æstate, viret usque ad Vergiliarum occasum, sabulosis familiarissimum." (xix. c. 8.) Ray describes the process: "Gemmas florumadultas—colligunt,—Tum vasi immittunt, et acetum super affundunt." Hist. Plant. 1629.

The caper plant is however supposed by many to be mentioned in Scripture by the name *abiyonah*, in Eccles. chap. xii. v. 5, which in the Septuagint and Vulgate has been translated *capparis*. This is not admitted by others, as in the authorized English version, where *abiyonah* is translated "desire." "When the almond tree shall flourish, and the grasshopper shall be a burden, and *desire* (abiyonah) shall fail." As the name *abionoth* was applied to the small fruits of trees and to berries, so it has been thought to be the same word as *abiyonah*, and to indicate the caper bush. This plant may have had two names in the Hebrew language, as indeed it has in the Arabic, and we may suppose it to be particularly adduced as growing especially on old walls and tombs. Further, if we suppose, as is natural, that the figurative language employed by Solomon is carried on throughout the sentence, it appears to me appropriate. For the caper plant, like most of its tribe, is conspicuous for its long flower-stalks, which are erect when the plant is in flower and the fruit young, but which bend and hang down as the fruit ripens. "As the flowering of the almond tree has been supposed to refer to the whitening of the hair, so the drooping of the ripe fruit of a plant which is conspicuous on the walls of buildings and on tombs, may be supposed to typify the hanging down the head before 'man goeth to his long home.'" Cycl. of Biblical Lit. art. *Abiyonah.*

The caper plant is too well known to require a description, especially as so many details have already been given respecting its habit. We have seen in the first place, that it has a name, *azuf*, in Arabic, sufficiently similar to the Hebrew *esof* or *esobh.* It is found in Lower Egypt, in the deserts of Sinai, and in Palestine. Thus it is found in all the places where the *esobh* must have been indigenous, for the Israelites to have been able to obtain it for their religious ceremonies. Its habit is to grow upon the most barren soil, or rocky precipice, or the side of a wall, and this is also essential; for it is said, that Solomon knew all plants, from the cedar of Lebanon to the hyssop that groweth on the wall. It has moreover always been supposed to be possessed of cleansing properties; hence, probably, its selection in the ceremonies of purification, or its employment in these may have led to the supposition of its possessing the power of curing diseases like leprosy. Finally, the caper plant is capable of yielding a stick to which the sponge might have been affixed, as we learn from St. John was done with the hyssop, when the sponge dipped in vinegar was raised to the lips of our Saviour. A combination of circumstances and some of them apparently too improbable to be united in one plant, I cannot believe to be accidental, and have therefore considered myself entitled to infer, what I hope I have now succeeded in proving to the satisfaction of others, that the Caper Plant is the Hyssop of Scripture.

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ART. XI. — *Summary of the Geology of Southern India.* By CAPTAIN NEWBOLD, F.R.S., &c., *Assistant Commissioner for Kurnool.*

[*Continued from p.* 171.]

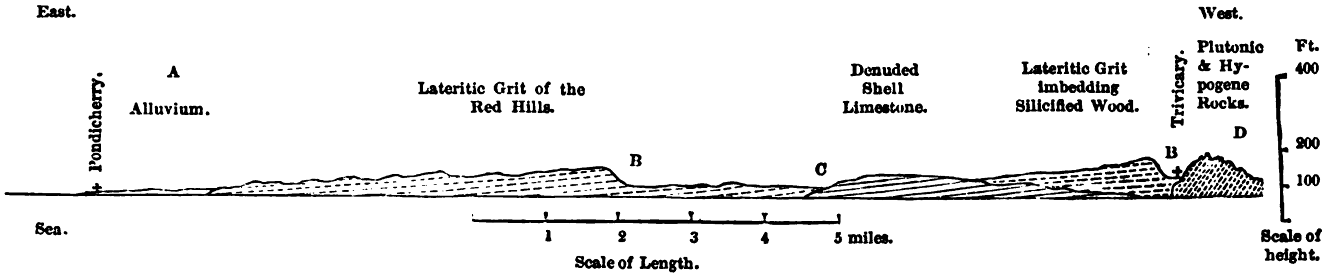
PART IV.

FOSSILIFEROUS LIMESTONE OF PONDICHERRY.

Geographical Position.—About nine miles inland of Pondicherry on the Coromandel coast, Lat. 11° 56′ N., are beds of limestone rising in gentle undulations, and running in a S.E. by E. direction, almost parallel with the coast, for a distance, as far as I was able to trace, of about four or five miles. Of these strata no detailed account had been published up to the date of my visit in March, 1840. They are seen to crop out near the villages of Sydapett, Carassoo, Coolypett, and Vurdavoor, from a superincumbent tertiary lateritic grit imbedding large quantities of silicified wood, and of which a description has been given by Lieutenant Warren: who has, however, overlooked the fossil limestone. The beds of the latter dip very slightly easterly. The greater part of the surface of the limestone is concealed by the soil and vegetation. A short distance further towards the west it is again covered by beds of the silicified wood deposit, and both are underlaid by plutonic and hypogene rocks, which crop out near the village of Trivicary, and form the western boundary of the fossiliferous beds. Rolled and angular fragments of the hypogene rocks are scattered here and there over the limestone, as well as fragments from the silicified wood beds, and from the limestone itself; the surface of the latter has evidently been exposed by the denudation of the superincumbent beds. It appears in surface-worn tables traversed by innumerable fissures.

Lithologic character.—It is usually of light brownish or grey colour; texture subcrystalline, graduating into earthy; tough under the hammer, and interstratified with argillaceous and ferruginous beds of a looser structure, which often abound with fossil shells. Some parts of the rock are so speckled with a dark-coloured sand as to resemble a *peperino,* though the nature of the sand, whether volcanic or not, cannot be safely pronounced upon. Other varieties are hard and compact enough to bear as fine a polish as many of our mountain limestones. It has been long used for the steps of doors, and in some of the pavements and old fortifications at Pondicherry; the remains of the old quarries are still to be traced though choked up by rubbish.

Section, nearly East and West, of the Fossiliferous Beds of Pondicherry, from the Sea to the Hypogene and Plutonic Rocks near Trivicary.



It will be observed in this section that, though the limestone has not been observed in contact with the hypogene and plutonic rocks, yet it is evident that it is of more recent origin, by the unconformability of the stratification.

The shells are, with few exceptions, pelagic: they occur distributed confusedly in the rock: the bivalves often vertical, and sometimes with their hinges uppermost. The valves of some are half opened: in others closed. Some have been deprived of one of their valves. Many have been compressed and flattened; and the exterior of a few exhibit distinct and beautiful impressions of smaller shells. The cavities of others again are filled with crystallized carbonate of lime; which may be received as an indication of the shell's being tenanted at the time of its entombment.

Since the period of my visit a large collection has been made of these fossils by Messrs. Cunliffe and Kaye, of the Madras Civil Service, most of which have been named as follows by Dr. Mc Lelland; whose list, as it comprises all the fossils discovered by myself, and many other species besides, will be adhered to, (merely arranging them after Lamarck,) until a more minute examination is made of them in Europe, whither a collection has been already transmitted for the purpose of a careful comparative scrutiny and classification. This they well merit, considering these beds and those of Trichinopoly are almost the only marine deposits that occur over the great extent of Southern India.

Class ANNELIDES,—Fam. *Serpulacea.*
Serpula recta.

Class CONCHIFERA,—Fam. *Arcacea.*
Cucullа crassatina (?) Desh.
Arca Cunliffei.
—— crassatina.
Nucula pectinata.

Fam. *Malleacea.*
Inoceramus.

Fam. *Ostracea.*
Ostrea trabeculata.
Gryphæa.

Class MOLLUSCA,—Fam. *Calyptracea.*
Piliopsis plana. Same, or allied to a shell in the coal formation at Cherra.
—— rotunda.

Fam. *Colimacea.*
Bulimus Indicus.
—— Pondicerianus.

Fam. *Melaniana.*
Melania (?) imperfect.

Fam. *Peristomata.*
Paludina[1], allied to Paludina semicarinata, Brand. Desh. Coq. Fos. Pl. xv. Species of this genus existing in India and elsewhere.

Fam. *Neritacea.*
Nerita transversaria. Single specimen, imperfect.
Natica sulculosa.
Nerita speciosa (?)

Fam. *Scalariana.*
Scalaria annulata.
——— zonata.
——— tricostata.
——— bicostata.
——— Kayeii.

Fam. *Turbinacea.*
Trochus linearis.

Fam. *Canalifera.*
Murex levis.

Fam. *Orthocerita.*
Baculites, compressed, tapering, and consisting of short joints. Margins unequal, both somewhat flattened.

Fam. *Nautilacea.*
Nautilus, three distinct species.

Fam. *Ammonacea.*
Ammonites.

Echini, fishes' teeth, and Hamites, corallines of the Turbinalia species, and others of a pyriform shape. There are also shells of the families Myaria, Nymphacea (Astarte), Cardiacea, Mytilacea, Pectinides, Ostracea (resembling Exogyra), Turbinacea (Turritella ?), Canalifera (Pyrula ?) Alatæ (Rostellaria?) Purpurifera (Buccinum ?) Convolutæ (Voluta), Ammonacea (Orbulites and Crioceratites). A number of sulcated cylindrical bodies, not exceeding the thickness of a quill, of different lengths, but generally from two to three inches long, and in all cases broken off, are scattered in the substance of the rock. They resemble somewhat the spines of echinides. There was also found the vertebra of a fossil which Professor Owen pronounces to resemble that of Mososaurus.

Mr. Murchison states in his Anniversary Discourse, p. 136, there can be no doubt that these fossils belong to the Cretaceous system.

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[1] It is much to be regretted that the only specimen in the collection is not sufficiently perfect to allow of the species to which it belongs being accurately determined; but the presence of a freshwater shell is important, as tending to show the deposit to have taken place near the mouth of a river, or in a basin alternately subject to salt and fresh-water.

Since then they have been ascertained by Professor Forbes to belong to the Lower Greensand, and Neocomian beds.

In a Paper by Mr. Kaye, in the Madras Journal of Literature and Science, for June, 1844, p. 151, that gentleman says, "In a former number of this Journal Lieutenant Newbold suggested that the fossiliferous beds of Pondicherry probably extended into the Verdachellum talook of South Arcot[1]. It was long before I was enabled to obtain any positive evidence of this fact; and it proves how little dependence can be placed on native evidence, that all inquiry among those who ought to have been best acquainted with local circumstances failed to elicit the required information. Accident, however, subsequently established the correctness of Lieutenant Newbold's views. * * * Mr. Murray, the Sub-Collector of South Arcot, in the course of a ride, about six or seven miles from Verdachellum, observed that the surface of the rock, by the side of the road, was marked with shells; and was kind enough to send me a few specimens, chiefly pectens." Mr. Kaye subsequently visited the locality himself: the fossiliferous limestone he found to appear first at the bottom of a valley near the village of Paroor, seven miles from Verdachellum, and forty from the coast: the high ground between it and Verdachellum consists of the red sand (resembling the red sandstone of Pondicherry,) in which was found a fragment of silicified wood; but the limestone rises into small hills on the opposite side of the valley. Mr. Kaye found in this limestone, Rostellaria, Arca, Pecten, Exogyra, Cardium, Lima, Terebratula, and other shells, which identify it, he thinks, completely with the Ootatoor beds near Trichinopoly, which will be described presently; and in addition a large number of Ammonites, of three or four different species, dissimilar to those of the Pondicherry beds: also portions of Nautili, and a Spatangus, similar to those of Pondicherry. Mr. Cunliffe, Mr. Kaye's zealous coadjutor in these most interesting discoveries, states that the genus Cidaris was numerous at Verdachellum, or rather, Paroor, though, as yet, undiscovered in the Pondicherry beds; and the Baculites of the latter were wanting at Paroor: and not a single chambered shell, save the cast of a single chamber of a large Ammonite, has been found in the Trichinopoly deposit at Ootatoor. Among the Verdachellum fossils were the bones of an *ophiura*, or star fish, which Professor Forbes pronounced to be the best preserved specimen he ever saw from the cretaceous beds.

Too much praise cannot be attached to the indefatigable exertions, zeal, and acumen of Messrs. Kaye and Cunliffe, who have thus established the interesting fact of the existence of cretaceous rocks in Southern India by a series perhaps of the most beautifully preserved fossils that were ever laid before the geological world, embracing many new forms, and some of Cypræa, Cerithium, &c., which were supposed to be peculiar to tertiary strata, but were doubtlessly formed in a cretaceous sea.

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[1] It is probable that these fossiliferous beds may be traced still further south.—T. J. N.

The Neufchatel beds, *Terrain Néocomien*, and the Neocomian strata of the Crimea, have been referred to the Wealden of British geologists; but by Mr. Murchison they are considered to be the equivalent of the lowest green sand of England, and of the *Hils-thon* of Römer in Hanover. The fossils of the Pondicherry beds will probably throw additional light on this *quæstio vexata.*

TRICHINOPOLY FOSSIL LIMESTONE.

About seventy-eight miles inland from the Bay of Bengal, in the vicinity of Trichinopoly, Lat. 10° 52′ N., and Long. 78° 46′ E., beds of a marine limestone occur, the geognostic position of which has not hitherto been described: though it is supposed they rest immediately on the plutonic and hypogene rocks which surround it.

The fossils brought thence are pelagic, comprising members of the families Serpulacea, Nymphacea (Tellina? Venus?), Cardiacea, and Arcacea, some of which are identical with those of the Pondicherry beds; also, Scalarias, Rostellarias and Turritellas. No Baculites, Hamites, or Nautili have hitherto been discovered, or other shells sufficiently characteristic to identify this deposit with the Pondicherry beds, from which they are distant about 100 miles to the S.W. The cast of part of an Ammonite, and a piece of silicified wood, resembling that of the lateritic deposit covering the marine limestone of Pondicherry, pierced by Teredines, have been found on the Trichinopoly beds.

The imbedding limestone, though bearing a general resemblance to that of Pondicherry, is usually less crystalline, looser in texture, and darker in colour than that of Pondicherry: and the organic remains in a better state of preservation, and more numerous.

Until more information be obtained, the geognostic place here assigned to the Trichinopoly beds must be merely considered as provisional.

PART V.

Fresh-water Limestones and Cherts.

We are now arrived at deposits which I have little hesitation in referring to the tertiary epoch. Although the deficiency of rocks of this age, and of the secondary period, forms a remarkable feature in the geology of Southern India, yet that of the former is not so great as has hitherto been generally supposed.

Nirmul Beds.—In the route from Hydrabad towards Nagpore, on the north bank of the Godavery, among the Nirmul Hills, and thence across the Wurda to Hingan-ghaut beyond the limits of our area, Mr. Malcolmson discovered detached beds of chert and limestone, containing shells, the general character of which Mr. Lonsdale considers to be that of fresh-water. The fossils were first found at Munoor, and between this village and Hutnoor, which is near the top of the Mucklegundi Ghaut, and in different parts of this pass leading into the valley of Berar. Mr. Malcolmson describes[1] the bed in which they were first observed to be a band of a singular quartz rock, projecting about two feet from the surface, half-way up the escarpment of the principal mountain, ascending the steep pass leading up the south side of the Nirmul Hills, and which is composed of concentric nodular basalt imbedded in a soft greenish wacké.

The quartz rock is remarkably scabrous, of various shades of white and red, and has cavities on its surface covered with fine silky crystals. Mr. Malcolmson observes, that it had every appearance of having been forced into its present position, when the basalt covered and partially melted the bed to which it belonged. Many fragments of this rock were found below with the shells; and it was again met with, together with the same and other fossils, imbedded in basalt, near Hutnoor. The specific gravity of this rock is 2·473, and some of the specimens effervesced feebly in acids, a portion of lime being dissolved.

The rock in which the fossils occur varies in different places: some of the finest specimens were obtained from a red chert with scabrous surface, having silicified shells distributed throughout its substance, or projecting from its surface. Besides testacea, this red chert contained small portions of silicified wood, and what Mr. Malcolmson considered, though he states at the same time that the specimens were too imperfect to admit of any certainty, to be the fragment of a bone, and of the tooth of a mammiferous animal.

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[1] Geol. Trans., Vol. V., Second Series, pp. 549, 550.

The finest Unios occur in a beautiful grey chert, imbedded in the basalt, or resting immediately on it. Some parts of the rock exhibit a mixture of sand, clay, and fragments of shells, of very moderate hardness, but the greater part consists of chert, the materials of which are occasionally arranged in a beautiful light blue enamel-like substance, around irregular cavities containing crystals of purple quartz. Some portions also exhibit a minute vesicular structure. Some are composed of a tough white clayey stone so soft as to stain the fingers: these contained Physæ, Paludinæ, and Limneæ, mostly converted into calcedony; but others retained their original structure, and effervesced with acids. Portions of charred vegetable matter, resembling small fragments of grasses and weeds, occur in these and in the harder cherts. Other specimens are composed of a greenish-blue crystalline mass resembling an ore of copper, (but it is of low specific gravity, and contains no trace of that metal,) and the imbedded shells are converted into the most beautiful crystalline quartz, retaining the form of every convolution of the Physæ and Paludinæ. Masses of a hard coarse chert consist almost entirely of Gyrogonites, but contain many of the same Physæ and Paludinæ. This rock appears to have formed beds of about half a foot in thickness; but it was not discovered *in situ*. A stratified rock was however found in the vicinity, consisting of a compact whitish chert, which contained Paludinæ and the finest specimens of Gyrogonites. Night prevented the connexions of this rock from being determined; the strata were, however, ascertained to be of considerable extent, and to be much buried in the soil: there were also numerous fragments of a siliceous rock, partly converted into black bituminous flint, or a coarse quartzose rock, partially altered into calcedony, by which most of the shales were also replaced.

After descending the second terrace a bed of white horizontally-stratified limestone, almost wholly composed of large bivalved Unios (named Deccanensis by Mr. J. de Carle Sowerby, 4 to 8 of description), is met with. The shells are not in very good preservation. Their edges, decomposing more slowly than the cement, jut out in relief. Hence the name of Mucklegundi, or *Bukre ke pan̆w ka putthur*, "sheep's feet stone," applied by natives to the pass and the rock, from the resemblance the shells are thought to possess to the impressions of the feet of these animals in clay. The Unios found in this bed have been identified with those in the chert at Munoor. It also contains a species not yet discovered elsewhere, viz., the Unio tumida? (11 and 12). At the bottom of the little cliff, where the granite is seen to underlie the fossils, very perfect Melaniæ were found in a fragment of a compact argillo-calcareous stone, identical with those in the limestone. The shells are fossilized by compact limestone, imbedded in a matrix consisting of calcareous matter mixed with small fragments of granite, and of a friable, grey, cellular substance resembling ashes, which occurs in situations where the limestone becomes concealed in the basalt, and is apparently imbedded in both rocks. The thickness of this fresh-water limestone bed, in one place where it is intersected by a torrent, is twelve feet, and it rests directly on red granite. The cherts all rest on, or have been entangled in the basalt, and are doubtless nothing more than the metamorphosed limestone; even the calcareous walls of the shells have been converted into silex. The basalt comprising the higher portions of the Nirmul Hills rests on this granite.

I have already transgressed my limits in tracing the course northerly of this interesting series of deposits, which were, probably, once continuous, until broken up, altered, and scattered by that prodigious eruption of trap which covers the greater portion of the Deccan: but I cannot refrain from quoting Mr. Malcolmson's interesting account of the Chicknee and Hingan-ghaut deposits which lie between the Mucklegundi Pass and Nagpore, separated by tracts of granite, blue limestone and sandstone, resembling those of Cuddapah and basalt: inasmuch as a brief description of the manner in which these fresh-water patches are distributed over the great overlying trap, will conduce more than anything else to a true conception of their origin.

Near Chicknee, the schist (viz., the red schist found above the limestone south of the Urjunah hot springs, and in various places of the diamond districts of the south,) rises slightly towards a basaltic ridge, in which the fossiliferous chert is likewise imbedded. The fossils occur on the surface, or are imbedded in nodular basalt, over several miles, being found in blocks of indurated clay, chert, and flinty slate. The appearance of the indurated clay is the same as in some of the specimens from the Sichel (Nirmul) Hills, but the clay is harder, full of cavities, and, in some cases, passes into perfect chert, or has waved lines of quartz or opalized matter diffused through the substance of the mass. Many Physæ, Paludinæ, and a few Limneæ, of the same species as those already noticed, are found in this indurated clay, or imperfect chert. Some of them are entirely converted into calcedony; others have the lime replaced by quartz, which is finely crystallized and covers the surface of the convolutions; or the columella only is preserved, passing across an empty cast of the shell. In some cases, however, the structure of the fossil is unaltered, and it effervesces in acids.

Flinty slate without organic remains occurs in the neighbourhood of these amorphous masses, and many fragments of the same kind, containing large compressed bivalves, are scattered about. In one block of this kind, portions of palm wood mineralized by black flint, intersected by fine veins of a light blue opal [of the same kind as occurs in some of the specimens of fossil wood from Antigua, by Mr. Stokes], was found associated with compressed very thick bivalve shells, probably referable to the same species as those of Munoor. At Hingan-ghaut, a few miles further to the north, considerable fragments of silicified palms and other plants were found in a black chert lying on the basalt, and similar masses, but without fossils, were imbedded in it. No organic remains were met with between this place and Nagpoor, the whole of the country being covered with a rich black soil, from which insulated basaltic hills with flattened summits rise abruptly.

In examining with the microscope sections of some of the silicified wood from the chert of Hingan-ghaut, one appeared to Mr. Malcolmson to be bone, which was examined by Professor Owen, who gives the following note:—"A section of this fossil was prepared sufficiently thin to allow of its being examined by transmitted light under a high magnifying power, when it was found to possess the structure characteristic of bone. Sections of 'Haversian Canals,' with their concentric lines, were everywhere present, interspersed with numerous Purkingian cells, or corpuscules: the size and disposition of these characteristic parts of the osseous structure agreed with those of the bones of the mammalia. It was highly satisfactory to find the microscopic test as available in demonstrating the presence of bone, when ordinary characters and the unassisted eye would have left the matter doubtful, as it is in reference to the determination of the teeth."

The silicified wood of these deposits appears to be chiefly palms; no specimens of dicotyledons are mentioned. The shells and charæ have been engraved and described by Mr. J. de Carle Sowerby as follows:—

1. *Chara Malcolmsonii.*—Oblong, spheroidal, with ten ribs; three of the ribs are produced at the apex. Natural size, and magnified.

This capsule is composed of five tubes, each of which is curled twice round. The figures represent a cast of the interior, the tubes being split down, and the outer halves broken away and left in the chert. The specimens are silicified, and constitute almost the entire mass of the rock, in which they occur associated with Physæ and Paludinæ.

2. *Cypris cylindrica.*—Twice as wide as long, almost cylindrical;

front very slightly concave; the outer surface, which is very rarely obtained, is punctured.

3. *Cypris subglobosa.* — Subglobose, triangular, inflated; front concave.

The outer surface of this crustacean is punctured as in *C. cylindrica.*

Both species occur abundantly in grey chert, with the *Unio Deccanensis* and other shells; and in various specimens of chert and indurated clay, containing *Gyrogonites, Paludinæ, Physæ,* and *Limneæ,* from the Sichel (Nirmul) Hills. The fossils are converted into calcedony.

4 to 10.—*Unio Deccanensis.*—Transversely oblong, rather compressed; margin internally waved; shell very thick; surface finely striated. Fig. 6 is in limestone from the northern descent of the Sichel (Nirmul) Hills; the others are in chert from Munoor. Natural size.

This species has often a ridge, which bounds the posterior portion, and is variable in size and elevation. It is most conspicuous in the limestone specimen, fig. 6, and in a cast in chert from Munoor, fig. 7. Fig. 8 is possibly a very young individual, before the margin had assumed its wavy form. Fig. 9 is from a part of a group of many individuals of nearly one size, badly preserved in the same limestone as fig. 6; but as they are generally oval, and do not show a waved margin, they may belong, as well as fig. 10, which is in grey chert from Munoor, to a species distinct from *Unio Deccanensis.* Some flattened specimens from this limestone are two and a half inches broad.

11 and 12. *Unio tumida.*—Transversely obovate, smooth, gibbose; posterior extremity rather pointed; beaks near the anterior rounded extremity. Natural size.

The section of the two valves united is regularly heart-shaped. The shell is rather thin, and it has something of the contour of *Cyrena.* It occurs in the same limestone with fig. 6, and the substance of the shell is replaced by calcareous spar, which cannot be broken so as to show the hinge.

13. *Limnea subulata.*—Subulate, elongated, smooth; spine equal in length to the body; whorls five. In a nearly white, soft, siliceous stone, from Munoor and Chicknee. Natural size.

14, 15 and 16. *Physa Prinsepii* (so named after the lamented J. Prinsep).—Ovate, rather elongated, smooth, spire short; body whorl largest upward. Fig. 16 in a soft siliceous stone from Munoor. Fig. 14 in chert from Munoor, and fig. 15 in chert from Chicknee; the drawing represents the shell as wider than it is. Many of the specimens are crushed. The largest, fig. 15, are two and a half inches long and upwards of an inch broad. Natural size.

17 to 19. *Melania quadri-lineata.*—Subulate, whorls about eight, with four striæ upon each; aperture nearly round. Fig. 17, in grey limestone from the same locality as 6 and 11. Fig. 18, in softish chert from Chicknee, associated with *Physa Prinsepii.* Fig. 19, in fine reddish grey chert, protruding from basalt near Munoor, appears rather shorter in form than the others, but the spire is not perfectly exposed nor entire. Natural size.

20 to 23. *Paludina Deccanensis.*—Short, conical, pointed, rounded at the base; whorls five or six, slightly convex, aperture round. Fig. 21 is in chert from Munoor; and figs. 20 and 22 in indurated clay from between Munoor and Hutnoor, the cavity of the shells being filled with calcedony. The young shell has a slight carina, shown in fig. 20. Fig. 23 appears to be a crushed specimen; it is in laminated, indurated clay, Munoor. This shell occurs, with *Physa Prinsepii,* in a beautiful green siliceous mineral at Munoor, at Chicknee, and at the bottom of the Nirmul Pass. All the specimens natural size.

These shells all belong to fresh-water *genera,* and to species which have not yet been discovered recent. The charæ, too, have not yet been found in the fresh-waters of India.

Similar beds of limestone and chert are scattered over the whole of the overlying trap region, and on its borders, in thin and circumscribed patches, and separated by distances often considerable, but imbedding similar fresh-water shells. Voysey[1] observed a stratum of earthy clay of different degrees of induration, twenty yards in length, and about two feet thick, containing a great number of entire and broken shells.

Near the summit of the table land of Jillan, in a pass ascending from the valley of the Taptee, or Berar, which separates the Gawilghur trap ranges from those of Nirmul, or Sichel, the shells are much compressed, and their structure seemed to Voysey to have been depressed by an overlying mass, fifteen feet thick, of the nodular basalt or wacké on which, too, this shell deposit rests. The vertical fissures, so remarkable in trap rocks, are prolonged from both the upper and lower rocks into the shelly stratum, although there is no intermixture of substance. The casts and fragments of the shells resemble those of the Paludinæ and other shells of the Nirmul Hills already described. Voysey discovered shells in an indurated fossiliferous clay near Nirmul and others in a siliceous rock containing lime, resembling in every respect the fossiliferous cherts of the Nirmul Hills, and like them imbedded in basalt, on the insulated hills of Medcondah and Shivalingapah, which rest on granite, south of the Godavery, near the south border of the great overlying trap, and also in the hills of Bicknoor-pett and Nugger.

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[1] Asiatic Researches, Vol. XVIII., page 192, and Journal of Asiatic Society of Bengal, Vol. II., p. 304.

Mr. Malcolmson[1] found in a specimen of the chert from Medcondah, in the Museum of the Geological Society, a Gyrogonite of the same kind as those of Nirmul, and halves of a species of Cypris associated with shales.

Dr. Spilsbury found, eighteen miles from Jubbulpoor, in the valley of the Nerbudda, blocks of "indurated clay," associated with the trap, containing casts of fossil shells, for the most part siliceous, and resembling those found by Dr. Voysey in the Gawilghur range on this side the valley. At Saugor, nearly one hundred miles to the north-west, reversed shells, stated to be exactly the same as those of Jubbulpoor, were discovered by Dr. Spry in a bed of limestone covered by seventeen feet of basalt, and resting on a coarse siliceous grit, underlying which the basalt again occurs. Fine specimens of silicified palm wood occur in the vicinity, as well as fossil bones of mammalia in a limestone capped by basalt. The drawings of the shells, Mr. Malcolmson observes, differ a little from each other, but the fossils are stated to be the same; and, as far as Mr. Sowerby could judge, they do not differ from the *Physa Prinsepii*. The similarity was more obvious in other specimens left in India.

South of the Nerbudda, fossils are again met with in the mountainous country north of the sources of the Taptee, at a place called Jirpah, near to which trap hills have broken through the sandstone.

Hydrabad Beds.—Between Beder and Hydrabad, on the south edge of the overlying trap, I found, in 1839, loose blocks of a greyish white limestone imbedding a few fragments of univalve and bivalve shells in so comminuted a state as not to be recognizable. The limestone in lithologic character closely resembles some varieties of the fresh-water limestone of Nirmul, and is equally broken up by the overlying trap. The blocks were partially converted into chert, and half buried in the soil covering the trap on which they rested. Thence, following the edge of the overlying trap in a south-westerly direction towards Bijapore, as it skirts the plutonic and hypogene rocks of the south to the valley of the Bima, between Muctul and Gulberga, another bed of fresh-water limestone occurs, extending from the vicinity of Koolkoondah northerly to Digaye, where it rests on blue non-fossiliferous limestone, which disappears under a great coulée of trap on the opposite bank of the Bima, between it and Gulberga. The specimens brought me by my friend Captain Wyndham contained only one description of shell, the *Paludina Deccanensis*. Still further to the west and near Ingliswara large blocks of the whitish grey siliceous limestone occur entangled in, and broken up by the trap, but I did not find they contained any fossils. It has in many situations been converted into chert and jasper, it is harsh and trachytic to the feel, and has an irregular sparry fracture; it usually appears on the sides and summits of hills, projecting in rough scabrous masses from the surface, easily distinguished from the dark trap. A similar limestone is noticed by Captain Coulthard[1], on the north-east side of the great trap region.

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[1] Transactions Geological Society, Vol. V., Second Series, pp. 570 and 571.

The only other described deposit of fresh-water shells is that about five miles south-west of Puddpungallee, which is ten miles south-west from Rajahmundry on the Godavery, a little above its delta. They occur in limestone, both underlain and capped by trap, evidently an outlier of the continuous trap formation so often alluded to in the account of these beds. Here, however, the deposit must have been in an estuary, or lake communicating with the sea; since Dr. Benza states[2] that among the *Limas* and *Melaniæ* he found oysters. They occur in a hill elevated about 300 or 400 feet above the plain in which it is situated, about fifty miles inland from the present coast line. The base of this hill as well as of the plain is of a red conglomerate sandstone, (evidently identical with the diamond conglomerates of Malavelly, Cuddapah, &c.,) resting on a grey non-fossiliferous limestone, seen in a lower situation nearer the Godavery; over the conglomerate is a layer of wacké with jasper, which continues about midway up the hill, where it is succeeded by a thick bed of the shell limestone capped by wacké and basalt. According to Dr. Benza, the limestone protrudes in a little ridge, a foot or two raised above the side of the declivity, running some hundred yards east and west, and cutting the hill in a direction parallel to its base, appearing to be vertically situated. The outgoings of this bed are tufaceous, as well as the surface of the implanted blocks all around it, and in which the fossil shells were clearly distinguishable; but when fractured deep exhibits a compact texture, a whitish colour verging to yellow, and a fracture semi-conchoidal and glimmering, on account of the numerous crystals of carbonate of lime, into which all the fossil shells are converted. It sometimes abounds with small cavities lined with calc-spar, and exhibiting only the impression of the shells, their substance having been absorbed. Loose blocks of the shell limestone are scattered about the nullahs and on the declivity of the hill; others implanted in the soil.

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[1] Asiatic Researches, Vol. XVIII., Part I., p. 59.

[2] Madras Journal of Literature and Science for January, 1837, pp. 50, 51.

The basalt is both compact and vesicular; sometimes approaching amygdaloid, the cavities often lined with calc-spar; the wacké underlying the limestone is veined with jasper, occurring also in beds and thin ramifications, which, in consequence of the wacké's easily weathering, are scattered about the surface. These jaspers and wackés exactly resemble those of the overlying trap. Most of the shells have evidently undergone violence, or compression, being fractured, and many of them reduced to small fragments. Some of the masses of the limestone are entirely composed of shell, converted into brilliant and sparry crystals of carbonate of lime.

The top of the hill forms a kind of table land capped with globular basalt decomposing in concentric layers, and extends apparently a few miles eastwardly. The loftier hills to the east of this, according to General Cullen, are of a similar formation; and as they present deeper nullahs, vertical escarpments and precipices, better opportunities would be afforded of observing the geological position of the strata. But of this interesting range no published account has been yet given. General Cullen has the merit of having discovered this deposit.

PART VI.

LATERITE.

Geographical Position and Extent.—Laterite occupies a larger portion of the superficies of Southern India than has been commonly supposed. The western coast is almost continuously covered by a sheet of this rock, extending, usually, inland to the very base of the Ghauts; and from the south of Bombay to Cape Comorin. Thence along the east or Coromandel coast it occurs in detached beds; the most considerable of which are those composing the Red Hills near Madras, Nellore, vicinity of Rajahmundry, Samulcotta, and into Cuttack.

It is found capping the loftiest summits of the Eastern and Western Ghauts; and of some of the isolated peaks on the intervening table lands. On those of the northerly parts of our area it appears in more continuous, and extensive sheets; often forming long low ranges of flat-topped hills, resembling in contour those of the horizontal sandstone and overlying trap formations. The laterite bed of Beder, in Lat. 17° 55′ N., and Long. 77° 34′ E., is about twenty-eight miles long from W.N.W. to E.S.E.; and twenty-two miles broad. It forms a table land, elevated, according to Voysey, at 2359 feet above the sea's level; and terminating to the north in precipitous façades, forming salient and re-entering angles, on the right bank of the Monjera. The average thickness of the bed is about 100 feet: its maximum 200 feet.

The Calliany Bed, about forty miles westward from that of Beder, is of still greater extent; and the intervening space has all the appearance of having been covered with a continuous bed stripped off by denudation, and exposing the subjacent trap, amygdaloid, and wacké. It extends southerly to the confines of the valley of the Bhima, about sixteen miles; and is upwards of forty miles in length, running nearly east by south. This sheet is not quite continuous; the laterite ranges, which are low and flat-topped, being separated by narrow valleys with flat bottoms based on trap.

Near Ingleswara, in the South Mahratta country, are some laterite ranges, the extent of which has not been exactly ascertained.

Farther south are beds of smaller extent on the table land around Kulladghi, Bagulcota, and Belgaum; and still further south at Bangalore and Bunwassi in Mysore. That at Bangalore is supposed to extend northerly towards the vicinity of Nundidroog. Laterite occurs also in scattered patches over the country below the high table lands of Mysore, south of the Salem break, throughout Salem, Coimbatoor, South Arcot, the Carnatic, Tanjore, and Madura; and covers a considerable portion of Travancore.

It is also found capping, in beds of considerable thickness, both the summits of continuous ranges,—such as those of Sondoor, Bellary, Kupputgode, south of Cuddapah, &c., and of isolated peaks,—the Nilgherry and Coorg Mountains. It occurs in more circumscribed and detached patches on the Eastern Ghaut line, and the beds are seldom continuous on broken ranges, as in the vicinity of Samulcotta, Chicacole, Bunlipatam, and in various localities in Goomsur[1].

In the hilly region bounding the Mogulbundi to the westward, from the Chilka Lake to the Subanrekha, the laterite lies in beds of considerable thickness on the feet of the granite hills, often advancing out for a distance of ten or fifteen miles into the plains, where it forms gently swelling rocky elevations, but never rises into hills; sometimes it is disposed in the manner of flat terraces of considerable dimensions, which look as if they had been constructed with much labour and skill. The granite appears to burst through an immense bed of the laterite rising abruptly at a considerable angle. This singular rock, unknown in Europe, is not confined to the Eastern peninsula of India, but extends as a fringe, with more or less interruption, to the shores of Birma, Malacca, Siam, capping many of the granitic mountains in the interior. I have seen it on the coast of Sumatra, and on many of the islets in the Straits of Malacca, invariably occupying the same overlying position. It occurs also in Malwa, many parts of Bengal, and in Ceylon.

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[1] Stirling's Account of Cuttack, pp. 15 and 16.

Physical aspect.—Lateritic districts have frequently been reproached for the sterile aspect they usually present. This arises chiefly from the too ferruginous or siliceous character of the rock, its porous structure, which does not admit of retention of moisture, and the property it possesses of hardening on exposure to the atmosphere. The soils formed by the weathering of the soft and argillaceous varieties of laterite are fertile, and produce abundant crops of rice, and of the dry grains that ripen in the early part of the season. Hills of laterite are usually distinguished, as before observed, by their long, low, flat-topped character, assimilating those of the trap and horizontal sandstone formations. The lands they support are, however, not so much furrowed as those of the sandstone by water channels, a circumstance ascribable to the drainage passing rapidly off through the pores of the rock. When capping detached rocks, the laterite usually imparts to the whole mass a dome-shaped or mammiform outline, or that of a truncated cone.

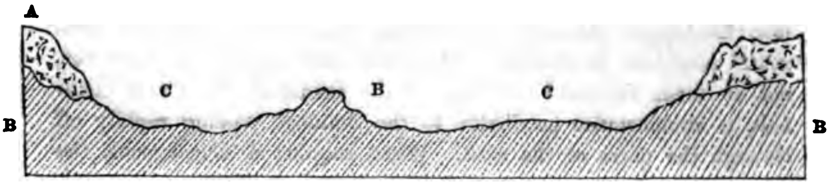
On the surface of table lands it is spread out in sheets, varying from a few inches to about 250 feet in thickness, terminating on one or two sides in mural escarpments.

Immense detached blocks, generally of a cuboidal shape, are often seen occurring on the flanks of the Western Ghauts, and on the southern slopes of the Sondur hills, often separated and dislodged; the valleys intervening between ranges of laterite hills are generally winding like those formed by the course of a stream, and flat-bottomed; particularly in districts where it overlies the newer trap.

From a general survey of its localities and position on the superfices of Southern India, it seems probable that the laterite extended over it far more continuously than at present; and that it owes much of its frequently insulated position to denudation,—the vestiges of which are clearly traceable in extensive tracts of lateritic gravel and debris, which are often re-aggregated; and it requires great care and observation not to confound such deposits with the true laterite beds from which they have been derived. As the land slowly emerged from the waters of the ocean, the process of denudation went on hand in hand with that of upheaval in laying bare the subjacent plutonic, hypogene, and trappean rocks. From the contour of the peninsula, and its general slope to the east, it is evident that the Western Ghauts must have first appeared above the surface, and the land to the east of this great chain by subsequent gradual efforts; the Coromandel, or eastern coast, probably appearing last. Hence the continuity of the lateritic zone is much more interrupted on this than on the western coast, where the elevation was at a much greater angle; as the course of the retiring waters of denudation must have followed the easterly direction of the present great lines of drainage.

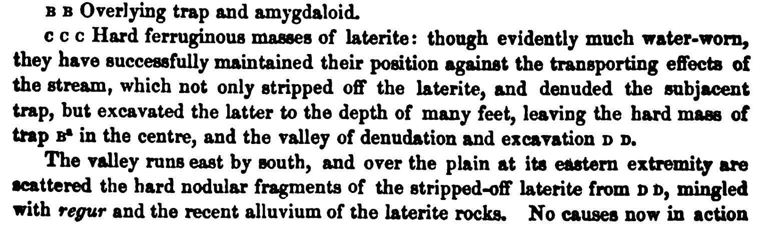
Natural sections often remind one forcibly of that striking instance of denudation of the red sandstone on the north-west coast of Ross-shire, given by McCulloch[1]. The following section, No. 1, is taken on the western coast of India, between Honawer and Sedashegur. No. 2 is from the cliffs of Beder, on the table land of the Deccan:

No. 1.



A A Beds of laterite once continuous, capping B B.
B B B Gneiss and hornblende schist.
C C Denuded space.

No. 2.



A A are cliffs of laterite from 90 feet to 120 feet high, once continuous.
B B Overlying trap and amygdaloid.
C C C Hard ferruginous masses of laterite: though evidently much water-worn, they have successfully maintained their position against the transporting effects of the stream, which not only stripped off the laterite, and denuded the subjacent trap, but excavated the latter to the depth of many feet, leaving the hard mass of trap B^a in the centre, and the valley of denudation and excavation D D.

The valley runs east by south, and over the plain at its eastern extremity are scattered the hard nodular fragments of the stripped-off laterite from D D, mingled with *regur* and the recent alluvium of the laterite rocks. No causes now in action could have effected these denudations.

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[1] Western Isles, Vol. II., page 93, plate 31, fig. 4.

Stratification and Dip.—Laterite usually occurs in tabular masses, which like the thick-bedded sandstones present no appearance of stratification. Where, however, the laterite loses its cellular structure, and takes the character of a sandstone or conglomerate, its true bedded structure is obvious. I have never seen its dip vary much from the horizontal.

Lithologic Character.—This rock derives its name *Lateritis*, (bestowed on it by Francis Buchanan,) from its being cut into the form of bricks, and used as such by the natives, who term it often in their own dialects the brick-stone. Buchanan[1] identifies it with the *Argilla lapidea* of Wallerius.

The laterite varies much in structure and composition; but, generally speaking, it presents a reddish brown, or brick coloured, tubular, and cellular clay, more or less indurated, passing on the one hand into a hard, compact, jaspideous rock, and on the other into loosely aggregated grits or sandstones, as at Beypoor near Calicut, Pondicherry, &c., and into red sectile clays, red and yellow ochre, and white porcelain earth, plum-blue, red, purplish, and variegated lithomarges. Sometimes it presents the character of a conglomerate containing fragments of quartz, the plutonic, hypogene, and sandstone rocks, and nodules of iron ore derived from them, all imbedded in a ferruginous clay.

The cavities are both vesicular, tubular, and sinuous; sometimes empty, but, in the lower portions of the rock, usually filled, or partially filled with the earths and clays above-mentioned, or a siliceous and argillaceous dust often stained by oxide of iron. A species of black bole, carbonized wood, and carbonate of lime, sometimes occur, but rarely, in these cavities. Minute drusy crystals of quartz not uncommonly line the interior.

The walls separating the cavities are composed of an argillo-siliceous paste, often strongly impregnated with iron, and frequently imbedding gritty particles of quartz. The oxide of iron prevails, sometimes to such an extent as to approximate a true ore of iron, and the nodules are often separated and smelted by the natives in preference to using the magnetic iron ore, which is more difficult to reduce, from its greater purity. When the whole mass is charged with iron, and very vesicular, (not unfrequently the case,) it might easily be mistaken for iron slag. The colour of the *parietes* separating the tubes and cells, which in the less ferruginous varieties is a light brick red or purple, changes into a liver brown; having externally a vitrified or glazed aspect; while the surface of the interior cavities puts on iridescent hues. The walls of these cells are sometimes distinctly laminated.

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[1] Journey through Mysore, Canara, and Malabar, Vol. II., pp. 436 and 440.

The specific gravity varies, as may be supposed from what has just been said. Many average specimens of the laterite of the Malabar coast I found to range between 2· and 3·2; that of the laterite of the Malay peninsula was found by Dr. Ward to be 2·536.

Before the blow-pipe the walls of the cavities melted into a black shining glass powerfully attracted by the magnet. The brown paste and ochreous dust contained in the cells did not fuse, but were converted into a cineritious slag less powerfully attracted, whilst the reddish and purplish portions hardened and remained almost unchanged beyond exhibiting scattered minute magnetic globules, having a dark metallic lustre.

The air exposed surfaces of laterite, as previously remarked, are usually hard, and have a glazed aspect, and the cavities are more empty than those in the lower portion. A few inches or more below the surface the rock becomes softer, and eventually, as it descends, so sectile as to be easily cut by the native spades, but hardens after exposure to the atmosphere. Hence it is used largely as a building stone in the districts where it prevails, and to repair roads. From its little liability to splinter and weather, (time appears to harden it,) it is a good material in fortifications; for which, and in the construction of their early churches, it has been largely used by the Portuguese on the western coast, and in their settlements to the eastward. The Arcaded Inquisition at Goa was built of it, and the old fortress of Malacca. The angles of the blocks of laterite in the remaining portions of these massive structures are as sharp and perfect as though the block had been separated from the rock but yesterday, although upwards of three centuries have elapsed.

The accumulation of the clays and lithomargic earths in the lower portions of the rock, which absorb some of the moisture percolating from above, renders the mass soft and sectile. These earths, doubtless, existed once in the upper cavities of the rock, from which they have been gradually removed to the lower strata by the downward action of the water of the monsoon rains. They accumulate at various depths from the surface and form impervious beds, on the depressions of which he water collects, forming the reservoirs of the springs we often see oozing, as at Beder, and many localities on the Malabar coast, from the bases and sides of lateritic hills and cliffs. Some of the tubes and cavities are *culs de sac,* and do not part with their contents, but the generality have communication with those below them, either directly or indirectly. The downward action of the water, by working through the thinner *parietes*, has tended to improve this communication: for we find in the laterite cliffs of Beder, where a horizontal layer of impervious matter occurs in the substance of the rock, that the sinuous tubes in the laterite immediately above it, have been diverted from their usual obliquely downward direction, to one nearly horizontal, showing that the water, on arriving at this obstruction to its progress downwards, spread itself laterally and horizontally over its surface.

In the same cliffs empty sinuous tubes, having a generally vertical direction, are observed, varying from a few lines to two inches in diameter, and passing from the surface of the rock to considerable depths in its substance. One was traced thirty feet until it disappeared in a projecting portion of the cliff.

They occur on a still greater scale, forming caverns of great extent, if we believe one tenth part of the native traditions regarding them. Such is the cave shrine of Sheikh Furreed at Cuddry, about two miles from Mangalore[1]. This is a hole in the centre of the side of a perpendicular rock composed of laterite, which is said to lead all the way to Hydrabad, 450 miles! The opening is square, about six feet above the ground, ascended by a flight of stone steps, just large enough to allow a person to crawl in. The cavern is very dark, and no one knows the exact size of it. Adjoining is a chasm in the rock, and of inconsiderable size, which at its entrance has been built up with stone, and an opening left for people to creep in by, as in the other; but this is found open within (or exposed to the air) after it is once entered. More than a century ago, a Mahomedan recluse, named Sheikh Furreed, took up his abode in the cave, and at the expiration of twelve years disappeared, and has never been heard of since. The popular tradition is, that he tried to get to Mecca by this subterraneous route!

There is another cavern of considerable size, in the laterite cliffs cresting the Sondur Hills, on the table land of the Ceded Districts, into which I penetrated a considerable distance; but not being provided with torches was compelled to return. The entrance was of an irregular oval form, not exceeding six feet in height, and bifurcating a few paces from the entrance into two winding galleries, leading obliquely downwards into the bowels of the rock. The floor is broken by rugged step-like descents. The cavern drips with water, and swarms with bats, hosts of which were disturbed by my intrusion. Its floor is formed of lateritic detritus, covered with the filth of bats, into which I dug for several feet in the hope of finding fossil bones, but was disappointed. The natives aver the cavern was the abode of a giant of old, and that it is of incredible extent.

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[1] Dr. Herklot's Qanoon-i-Islam. Glossary, pp. LXIX and LXX.

There is a similar cavern in the laterite hills of Ingleswara, in the Southern Mahratta country, (of the extent of which the natives have the same extravagant traditions,) and said to communicate with another cavern at Nagarhal. In the laterite cliffs of Beder, a narrow winding cavern, about sixty yards in length, forms the outlet of the fine spring of the Farabagh. The Brahmans, ever vigilant in turning the phenomena of nature to extending their dominion over the minds of the superstitious Hindú, have seized on both these last caverns, have converted them to places of idol worship, and guard their entrances with Cerberean pertinacity.

In the lateritic belt running west of Indore, Oojein, Mahidpore, and Barode, I perceive Captain Dangerfield[1] has marked down in his map the site of some caves at Doomnar.

The water that percolates through the roof of these caves in the laterite is often charged with iron, which it deposits in stalactitic, or botryoidal incrustations. The same occurs on a much more minute scale in the smaller tubular and vesicular cavities. Curious spheroidal, reniform, and cylindrical bodies, often as large as a cocoa-nut, have been found in the laterite and mistaken for fossil seeds. Their *parietes* are usually composed of gritty particles of quartz, often stained by iron, cemented by a ferruginous matter: their cavities, often empty, usually contain an ochreous, siliceous, and argillaceous dust; as at Stripermatoor, and Pondicherry.

Associated Minerals.—Nodular, reniform, and pisiform clay iron ores occur pretty generally distributed. I have discovered veins and nests of black manganese in the laterites of Beder, Calliany, Ingliswara, &c., also alum, and muriate of soda, in that of the Ceded Districts near Bellary; large beds and nests of lithomargic earths, and white porcelain earths, are not uncommon. General Cullen informs me he found a layer of lignite in the laterite of the western coast at Korkully, about fifteen miles south of Quilon, imbedded in a stratum of dark shales and clays. The bed was quite insulated, slightly inclined, and of a lenticular form, five or six feet thick at the most: the upper portion of the cliff, which is about eighty feet high, consists of the indurated dark red laterite, gradually changing, as the depth increases from the surface, into bright and various colours: in these lower portions the bed of lignite occurs.

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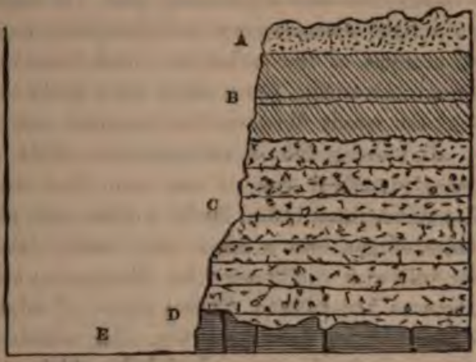
[1] Malcolm's Central India, Vol. II., Geolog. Map.

General Cullen recently writes me that lignite occurs in other localities in the laterite of Travancore, and that graphite in scales seems to be rather common in it; chiefly conspicuous in the laterite about Trivandrum and Quilon. It occurs still further south in large and thick scales, and disseminated very generally also in a kind of laterite close to the foot of the mountain, about twenty-five miles east of Trivandrum.

In 1840, I discovered a bed of lignite with resinasphalt, sulphur, alum, (the result of decomposing iron pyrites,) and mineral copal, near Beypoor in the vicinity of Calicut on the Malabar coast, in a bed of loose sandstone, into which the laterite passes, on the right bank of the river, immediately imbedded in layers of black carbonaceous and aluminous shales and clays containing scattered spangles of mica.

The following is a section of the beds, which rise about forty feet above the river's then level.



A Sandy alluvial soil.
B Loose lateritic sandstone with beds of ochreous earth.
C Gritty sandstone passing into laterite; variegated in its lower portions with red and yellow bands.
D Stratum of black aluminous shale and clay imbedding the lignite, &c.
E Level of the river.

The beds dip conformably at an angle of four degrees towards the north-east. The lignite bed can be traced about half a mile easterly up the river where it dips below the river's level. Its structure is obscurely stratified, crossed by vertical fissures, surfaces of which are frequently covered with a yellowish efflorescence, consisting of sulphur, iron, and alumina; sulphur, and oxide of iron, also occur uncombined. The carbonized branches, leaves, and trunks lay horizontally in the black shale. Some were fibrous, toughish when struck by the hammer, and heavy, resembling wood recently charred; others were brittle with a resinous fracture and lustre, resembling bitumen. Many fragments were penetrated with water, holding iron and alum in solution: the former of which appeared on their surface as a glittering reddish-brown coating. The woody structure was, in general, sufficiently distinct to show that the principal trees imbedded were dicotyledonous. Impressions of leaves and stems of plants were abundant between the layers of shale; but I did not observe any of the dicotyledonous seeds which occur in the lignite beds of Travancore. Some were perfectly black; others of different shades of brown exhibiting different degrees of carbonization. A portion of a black carbonized leaf burnt slowly with a slight flame into a reddish ash, white on the edges. This being subjected to the reducing flame melted on its edges partly into a greenish enamel, and partly into a dark slag affected by the magnet.

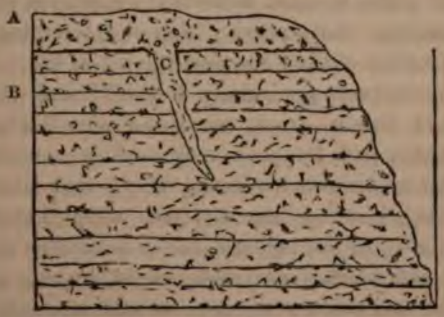
The imbedding black shale decrepitated slightly before whiteness, emitting an odour like that of burning coal. It finally fused on the edges into a light greenish-grey enamel, slightly magnetic. The most resinous portions of the carbonized wood burned with a clear flame and bituminous odour, into a white ash: while those in which the elasticity of the woody fibre was less impaired, scarcely gave out any flame at all, burning into a reddish-brown cinder. The odour emitted, however, resembled that of coal more than that of burning charcoal. The cinder fused before the blow-pipe, after giving out two or three bubbles of gas, into a black slag readily attracted by the magnet. The yellowish cauliflower-like efflorescence on the surface of the carbonaceous bed emitted distinct fumes of sulphur on being subjected to the oxidizing flame; melting, after considerable gaseous extrication, into a dark cinnabar-red globule, which, on being subjected to the reducing flame, was converted, with diminution of bulk, into a black magnetic slag.

The change of colour and driving off the carbonaceous matter by heat, tended greatly to develope vegetable character, fibre, &c., where none was before apparent, or very obscurely so. The specific gravity of the heavier portions is 1·270, slightly exceeding the average specific gravity of coal, which is 1·250. This deposit of vegetable matter has evidently been made tranquilly, from the flat horizontal position of the layers of leaves and stems.

Since writing the above, General Cullen informs me that he now sees much of the carbonaceous deposit in Travancore, and that it is very extensive. It exhibits itself in beds of black clay and lignite, of from fifty to sixty feet thick, in some places 200 feet, along the laterite cliffs at Venkully, for a distance of three miles; in fact, all along the coast from Quilon to Venkully. Deposits of the same kind occur about the same level, at the distance of two or three miles inland. A similar deposit is seen on the sea shore, about thirty miles south of Trivandrum. The trunks, or rather their fragments, were both of monocotyledonous and dicotyledonous wood in a state of perfect carbonization, and abounded with sulphuret of iron.

Origin.—Writers on Indian geology are divided in opinion as to the origin of laterite. With regard to the igneous theory as originated by Voysey, taken up by Calder, and put forth by Mr. Conybeare, it must be remarked that, hitherto, no decided volcanic product has been discovered in laterite, no crater or other proof of such origin. It is true, it is frequently seen overlying trap rocks; but it also overlies granite, hypogene strata, sandstone, and limestone, and in none is it ever seen as a dyke; nor are there any signs of forcible intrusion or alteration. In one hand specimen that fell under my observation, the laterite *appeared* to have intruded into and shattered the sandstone; but in every instance where I have had an opportunity of seeing veins, if they may be so termed, of the laterite in other rocks, *in situ*, they have occurred as deposits *from above*, into pre-existing chinks of the subjacent rocks, like the conglomerate which fills fissures in the limestone of Petit Tor; and never injected from below, as is the case with volcanic rocks.

The following section exhibits the laterite filling a chink in the subjacent sandstone of Ganjicotta, in the Cuddapah district.



A Laterite capping sandstone.
B Sandstone.
C Chink in sandstone filled by laterite from above.

Fragments of trappean, and other rocks, occasionally are imbedded in the laterite; as also in the subjacent sandstone, and in other rocks confessedly of aqueous origin. Cases occur where basalt underlying the trap as at Beder, has the appearance of passing into it: but this, on minute examination, turns out to be a confused blending of the debris of both rocks near their junction; from which distinct and unmixed fragments of either sort could be separated, like bits of granite from the breccias that are usually found near the junction of the latter with sandstone. In many localities, however, the line of demarcation between the laterite and overlying trap is clear and decided.

Some geologists suppose that laterite is nothing more than granitic, hypogene, and trappean rocks weathered *in situ*. The facts of its imbedding erratic fragments of sandstone, at the Red Hills near Madras, where it rests on granite, and its interstratified beds of lignite and silicified wood, militate strongly against this theory. Besides, nothing is more common in lateritic tracts than to see a hill of granite, trap, or hypogene rock, capped with a thick crust of laterite; while the adjacent hills, composed of an exactly similar rock, and forming a continuation of the same bed, equally exposed to the action of the weather, are quite bare of laterite. I have examined many beds of it resting on trap, and amygdaloid imbedding calcedonies, heliotrope, and jasper, but have not hitherto detected in the upper or middle beds of the former, any fragments of these hard siliceous minerals, which are found to resist successfully the attrition of the most rapid streams of India, and have been carried by them across the peninsula to the ocean.

I have seen laterite, too, resting on limestone, without any traceable lime in its composition: and containing veins of manganese, when resting on a trap in which hitherto the existence of this mineral has not been detected: facts, proving that the overlying laterite was not the upper portions of these rocks weathered *in situ*.

I have often observed, particularly in the Western Ghauts, and on the Malabar and Concan coasts, where the rains fall heaviest, those granitic, hypogene, and trappean rocks, which contain most iron, weather into ferruginous and coloured clays, that sometimes lithologically speaking, resemble laterite; and, when that rock is near, have *the appearance* of passing into it. I have also observed large beds in gneiss and hornblende schist, of an impure oxide of iron, assume a cellular and pisiform aspect; but such must not be mistaken for the true laterite, nor yet the beds of re-aggregated gravel derived from the laterite.

When we look up from the microscopic view afforded by these slowly weathering blocks of rock and beds of ore, and cast our eyes upon even the present extent of laterite over the surface of India, the thickness of its beds, its flat-topped ranges of hills, and the gaps effected in their continuity, evidently by aqueous causes no longer in action, its occasionally imbedding waterworn pebbles of distant rocks, its often elevated position above the present drainage level of the country, its beds of lignite and silicified wood, we find no more reason for attributing its origin to the weathering of rocks *in situ*, or to their detritus transported by causes now in action, than for attributing the formation of the older sandstones to the present disintegration of the granitic and hypogene rocks, of the detritus of which they were doubtless, as well as the laterite, formed originally.

The supposed non-fossiliferous character of this rock, which has puzzled many geologists, and inclined others to the theory of its ancient or volcanic origin, may in some measure be attributed to its highly ferriferous nature, often approaching that of an oxide of iron. It is a general fact, and, as Lyell observes, one not yet accounted for, that scarcely any fossil remains are preserved in stratified rocks in which the oxide of iron (derived from the disintegration of hornblende or mica) abounds: and when we find fossils in the new or old red sandstones of England, it is in the grey, and usually calcareous beds that they occur. It is well known, too, that some of the more recent tertiary deposits of Europe are entirely divested of fossils.

As this singular variety of ferruginous clay and sandstone has not been mentioned by geological writers on other countries than those I have alluded to, it may be presumed that laterite either does not exist under this form at all, or in such small patches as not to have attracted remark. The question naturally suggests itself, why this cellular rock should be confined to India, &c. The solution may be in the highly ferriferous nature of the plutonic, trappean, and hypogene rocks, from which the laterite has confessedly been derived, and in the supposition of a segregation and subsequent re-arrangement of the different mineral particles in the substance of the rock itself, by a process in nature's laboratory, approaching to crystallization, better known than explained or understood. If electricity, which is probable, has any share in exciting this movement and attraction in the mineral particles of the rock, its metallic nature affords a favourable condition for the active development of this powerful agent. The structure of the rock has received some modification from the action of water, in emptying its cells and carrying their contents to the lower parts of the beds.

Age.—Having said thus much to warrant the classification of laterite among rocks of an aqueous and mechanical origin, I shall proceed to remark that in age, relatively to other rocks of Southern India, it is older than the *regur* and *kunkur*, which it underlies, and of more recent origin than the overlying trap, the shell limestone of Pondicherry, and the diamond sandstone and limestone, on all of which it is superimposed. It has never been invaded by the dykes of trap that penetrate the latter rocks—the hypogene and plutonic rocks,—fragments of all which it sometimes imbeds, but is evidently contemporaneous with the efforts, or series of efforts, by which the Western Ghauts were lifted above the waters; since it is seen capping their summits, often shattered into large irregular blocks, and stretching more continuously, and with less signs of disturbance, from their base to the sea.

From the non-altered state of the laterite at its junction with the granite, and the imbedded fragments of the latter rock, as well as of fragments of the trap dykes, it may be inferred that both granite and the associated trap dykes were elevated in a solid state. I have classed the laterite as more recent than the Nirmul fresh-water cherts and limestones, on account of the latter rocks having been invaded and altered by trappean intrusion.

Pondicherry Silicified Wood Deposit.

A short distance inland from Pondicherry beds of a loose ferruginous grit rise into a low range of hills, called, from the colour of the rock, the Red Hills. They run in a north-north-east direction, almost parallel with that of the coast. They are about two miles in breadth, and about eight or nine in length. The deposit, probably, extends further in a southerly direction than the north bank of the Ariacoopang river, to which I traced it from the vicinity of Camlaput on the north. The locality where the silicified wood is found in greatest abundance is in the vicinity of Trivicary, about fifteen miles west of Pondicherry. Between the Red Hills and the sea extends a plain covered with an alluvial sandy soil, and underlying it a greyish-black or dark clayey loam, resembling that of Madras, imbedding fragments of grit and recent pelagic shells. The descent from the hills towards Pondicherry is gentle, but steeper on the western flank, where the strata have been evidently stripped off, and the subjacent fossiliferous limestone denuded[1], leaving a shallow valley, marking the discontinuity of the strata, between this point and where the beds again appear in the vicinity of Trivicary, on the opposite or western side of the valley.

Here they form a low broken range of hills, not rising higher than from fifty to one hundred feet above the general level of the plain, having a parallel direction with the beds on the eastern side, and sloping gently towards the east. The western flank is rugged and precipitous wherever it meets the hornblende schist, which flanks it to the west, near the village of Trivicary. A narrow valley marks the junction line, covered with the detritus of both rocks. Here silicified trunks of trees have been imbedded in the grit in a nearly horizontal position. The stems are both strait and crooked, generally without roots or branches; though the former have been found, and the places of the insertion of the latter are frequently strongly marked on the stem. They are monocotyledonous, and dicotyledonous; coniferous, and non-coniferous. Dicotyledonous wood is, however, most abundant. One of the trunks I found to measure twenty feet in length, and from one to two and a quarter feet in diameter.

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[1] Vide Section accompanying description of the shell limestone of Pondicherry, p. 214.

Lieutenant Warren, in the Asiatic Researches, describes a trunk about sixty feet long, and from two to eight feet in diameter: but this has been broken up by the native collectors of petrifactions. The organic and microscopic structure of the wood, in many specimens, is beautifully preserved. The siliceous matter of petrifaction is often semi-transparent, like chert, or calcedony, or opalized, or striped with lively bands of red, like jasper. It varies in colour and texture from an opaque whitish chalk-like stone, to a red and white carnelian, giving fire with steel; the prevailing tints are delicate shades of brown and grey. The inner portions of the tree have been usually more perfectly fossilized than the exterior; which appears to have been, in many specimens, bruised as if by drifting, and deprived of its bark. The outer portions usually exhibit the most lively colours. Drusy crystals of quartz sometimes line their cavities. The carbonaceous matter of the wood has entirely disappeared, and nothing but silica and iron left.

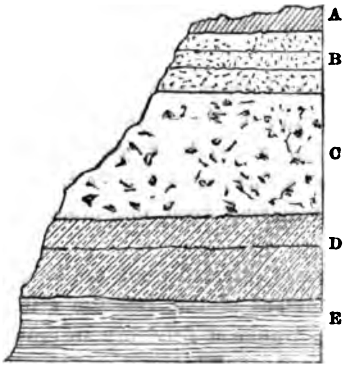
The fossil trunks and fragments of silicified wood occur partly imbedded in the rock, and partly scattered over the soil and detritus. Numbers have been broken and destroyed by the natives to sell to the stone polishers, who manufacture the most attractive fragments, under the name of petrified tamarind wood, into brooches, seals, beads, studs, bracelets, boxes, &c.

Although fragments of silicified wood are found scattered here and there over the whole extent of this lateritic grit, yet the space into which the largest fossil trunks at Trivicary are crowded does not occupy an area of two square miles. There are no signs of any bed, like the Portland dirt-bed, in which they formerly grew, and no carbonaceous matter; and I have little doubt the trunks were drifted to the situation where they are now found at the edge of a granitic shore, and covered with sand and pebbles: it is very clear that they did not grow on the spot where they are now found petrified, mutilated, and prostrate, as supposed by many travellers.

Lithologic character of the Rock.—The imbedding rock is for the most part composed of angular grains of quartz, often stained with iron, and loosely cemented together by dark red and whitish clays, passing into a conglomerate, and into a tubular and cellular rock, differing in no respect from some varieties of laterite. The latter is seen at intervals occupying an exactly equivalent position along the coast to the northward. It imbeds similar layers, and nests of lithomargic earth. The singular hollow spheroids and tubular bodies, already described, are common to it and to the beds to the north in the vicinity of Madras. They have been mistaken for petrified fruit and seeds, but possess no traces of organic structure; and, in many cases, have originated from the action of water on the porous structure of the rock. The imbedded pebbles are both rounded and angular, the former predominating,—and are for the most part of quartz and chert, with a few pebbles of trap and the hypogene rocks.

The beds near Trivicary are shattered by deep vertical fissures. Their surface presents strong traces of watery erosion in a number of channel-shaped, sinuous, and basin-like cavities, some in situations above the influence of present drainage. Many of them contain sand and water-worn pebbles, similar to those in the subjacent rocks. Among the gravel scattered on the surface I found a pebble of the subjacent limestone, and several of greenstone.

The following presents a section afforded by some cliffs near the south-west extremity of the Red Hills.



A Surface gravel, about 2 feet thick.

B Loose red grit, about 4 feet.

C Grit with fragments of weathered quartz and felspar, 8 feet.

D Red grit with rounded pebbles of greenstone and quartz, passing in its lower portions into a variegated red and yellow grit, 5 feet.

E Variegated red and yellow grit, 4 feet.

All the beds below the gravel are interstratified with thin layers of purplish and white lithomargic clays, resembling those in the laterite.

The silicified wood of the Egyptian desert closely resembles that of Pondicherry, as also the rock in which it is imbedded at the "Fossil forest," near Cairo, not only petrologically, but in *gisement*. Both occupy overlying situations covered with gravel, sand, and other detritus, and rest on a marine limestone in strata but little inclined from the horizontal. Both have suffered from aqueous denudation exposing the subjacent limestones. I could not discover the least trace of extinct volcanos, or of volcanic substances, in the vicinity of either.

I am not aware of any other places in Southern India where fossil wood is found except Mungapett[1], and a few other localities on the banks of the Godavery and Wurda, where silicified coniferous wood occurs in very small quantities, and at Hingan-ghaut, on the north bank of the river, where silicified branches of dicotyledonous trees, and a very perfect portion of a palm, were found in loose blocks of a black and red chert resting on the newer trap formation: I am rather inclined to refer this to the fresh-water chariferous limestone and chert formation, than to the laterite and Pondicherry beds.

MARINE SANDSTONE BEDS OF RAMNAD AND CAPE COMORIN.

On the eastern coast, near the southern extremity of the peninsula, are some beds of sandstone. The shells they imbed (as far as their fractured state would admit of their being recognised,) are of species existing in the adjacent sea; they are tertiary, and may be classed, for the present, with the laterite and Pondicherry sandstone. The rock is of a less ferruginous character than either, and consists of a marine sand, rather loosely aggregated.

It occurs in some cliffs on the coast of Ramnad and stretches across the straits to Ceylon, as a low interrupted ridge, partially covered at high-water mark, and known by the name of Adam s Bridge.

Some of the more solid portions of this ridge, or reef, still remain in an insulated position, considerably elevated above the water's edge: for instance, the two hills on the island of Ramisseram, and the island of Manar. The intervening portions, and the direction of the ridge, are marked by a chain of sand banks; based, there is reason to believe, on the same sandstone which is found below the water level in the Paumbam passage.

This singular barrier of rocks, through which Government has succeeded in blasting a narrow passage, and partially opening the navigation of the Manar Straits to steamers and other vessels of small draught, formed once the bed of the sea; and was subsequently elevated to its present position, probably at the same period with the laterite.

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[1] Malcolmson, Madras Journal of Literature and Science, July 1836, p. 216.

The strata are perfectly horizontal, and rest on a bed of gravel in some places consolidated into a conglomerate[1]. Similar strata form the geological structure of the southern portion of Ramnad and Tinnivelly.

Near Cape Comorin similar beds of marine sandstone are said to occur. Dr. Davy[2] notices identical beds of sandstone on the opposite coast of Ceylon, which he describes as being composed of siliceous sand, and minute fragments of shells: he considers it recent, and the process of consolidation still going on. It has, he observes, formed in many places below high-water mark.

Captain Jenkins, of the Quarter-Master-General's department, informs me that the natives have a tradition, that the low country of Ramnad, as far as Madura, was once covered by the sea.

PART VII.

Older Alluvium; Changes in Level of the Land and Rock Basins.

The rarity of beds and scattered boulders of true drift in Southern India, may be considered to add to the evidence already accumulated in favour of the theory, that icebergs floating in the ocean have been mainly instrumental in the transport of the vast masses of rock and detritus, principally granitic, which cover tracts of land in the higher latitudes of Europe and North America; indicated chiefly by their prevalence in northern regions, and rarity in those bordering, and within the tropics, and their recurrence in high southern latitudes; for instance, in Chili and Patagonia, where they appear with precisely the same unstratified aspect, the same mixture of vast rolled and angular blocks transported to great distances, over chains of hills, rivers, &c., from their original *situs*.

It is well known that the usual course taken by icebergs from the confines of the polar circles of eternal congelation is towards the temperate latitudes. These icebergs, as we know from the writings of Scoresby[1] and other navigators, have been seen drifting from the arctic regions freighted with beds of rock and earth, the weight of which was conjectured to be from 50,000 to 100,000 tons. These icy vehicles, long before arriving at equatorial regions, melt and shower down their rocky burthen on the bed of the ocean, or, stranding on some coast, gradually dissolve and deposit the blocks and sand in one confused heap.

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[1] Madras Almanac, 1841, p. 47; Account of Ramisseram, by Assist.-Surgeon J. Kellie.

[2] Trans. Geol. Soc., Vol. V., Part II., p. 326.

Brogniart, apparently on the authority of M. de Luc, has given his opinion, that the blocks of granite around Hydrabad are real boulders; but after a careful examination, I feel convinced that these masses are *in sitû*, and resting on a granite and its detritus perfectly identical with that of which they are composed. They owe their globular shape, their scattered and isolated position, to such a process of weathering and spontaneous concentric exfoliation as I have attempted to describe in a previous and separate paper, on the subject of the Granites of India and Egypt.

As the terms "drift," "boulder formation," and "diluvium," have been latterly almost exclusively applied to the detritus supposed to have been deposited by the thawing of glaciers or icebergs, I have thought it requisite, to avoid any mistake as to their origin, to apply the designation of alluvium, in its extended sense, to certain beds of gravel and sand that are occasionally found covered by the regur deposit, and which occur in such situations as not to be accountable for by the agency of existing transporting powers; simply prefixing the term "older" to distinguish it from the alluvium now forming from the disintegration of rocks washed down by the rains and springs, and transported by rivers and local inundations.

The beds of older alluvium have been little attended to by Indian geologists; and few have therefore been described. Future investigation, I have little doubt, will disclose to us many more deposits than those now about to be pointed out.

DIAMOND GRAVEL OF CUDDAPAH.

At Condapetta, in the Cuddapah diamond district, underlying a bed of regur in some places twenty feet thick, is found a gravel bed, which I found to cover an area of several miles, from two to six feet thick, resting upon the diamond limestone. I saw no pebbles, (with the exception of a few nodules of *kunker* which may have been recently formed in it,) of more recent origin than the diamond sandstone and limestone. It was principally composed of rounded fragments of trap, granite, and the hypogene schists, which must have been transported from the distance of twenty or forty miles, intermingled with pebbles of quartz, jasper, and chert, and others from the adjacent sandstone and limestone. In this gravel, intermixed with kunker and iron ore (the oxide), the diamond is found as a transported crystal or pebble, often fractured, and with slightly worn edges. The diamond gravel near Parteal[1] consists of a bed two feet thick, composed of pebbles of sandstone, hornstone, quartz, jasper, and flint, with fragments of occasional rocks, epidote, and abundant ferruginous sand, lying under a layer of tufaceous carbonate of lime (kunker) cementing similar gravel, but in which the diamond never occurs. Both deposits are covered to the depth of fifteen feet by the recent alluvium of Ellora, which overspreads the space between the deltas of the Kistna and the Godavery.

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[1] Voyage, 1822, p. 233.

Wakoory Bone Deposit.—In the Nizam's territories[2], at Wakoory, about twenty-two miles south-east from the cantonment of Hingoli, is a bed of gravel, cemented by kunker, which appears to underlie the whole valley of the Baingunga; and there is reason to suppose that the same stratum underlies the alluvial black soil of the valleys in the vicinity of Hingoli. In 1837 the river at Wakoory rose to an unprecedented height; the stream left its own bed; and, in falling into the Baingunga river, about a mile from Wakoory, washed away much of the black soil from the right bank, thus exposing the substratum of gravel cemented by kunker. A considerable portion of the latter was also cut away, by the force of the water in its fall of about forty feet into the Baingunga.

During the process, the tusks and bones of a large animal were washed bare, at a depth of from forty to fifty feet, imbedded in the gravel. The village cow-herds, it is said, broke the bones, and otherwise destroyed the skeleton, before it was known at Hingoli that such discovery had taken place. Steps, however, were taken to prevent further destruction, and all that appeared were secured; viz., three pieces of the tusks (there were two tusks distinct, *in situ*, in the gravel forty feet below the surface,) and one long fragment of bone; all the other large bones had disappeared. A mass about five feet long and two feet broad of jumbled bones and gravel, remained.

Part of the tusk, half fossilized by carbonate of lime, I took to England in 1841, and showed it to Professor Owen, who immediately pronounced it to be fossil ivory; probably a Mastodon's tusk.

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[1] Captain Macpherson, Asiatic Researches, Vol. XVIII., pp. 118 and 119.

[2] Madras Journal of Literature and Science, for April, 1838, p. 477.

The large collections of fossil bones from the basin of the Jumna[1], were found under the kunker clays of the Dooab, 150 feet below the surface, but the sand and gravel of the Sewalik and Nerbudda bone beds were cemented, like the gravel bed of Wakoory, by calcareous infiltration.

During the boring experiment at Calcutta in 1837, a fossil bone,—the fractured lower half of a humerus of some small animal of the canine species,—was brought up by the auger from a depth of 350 feet below the surface of Calcutta, in a bed of quartzose and micaceous sand, about 250 feet below the extensive alluvial deposits of the yellow kunkery clay, which entirely cover, or rather form, the Gangetic Plain. The sand bed was underlain by a bed of black peat clay, imbedding black carbonized wood, between peat and lignite, and perfectly carbonized wood, resembling the Assam coal, in rolled lumps. The last were found at the depth of 392 feet. Two fragments of fossil Testudo, and a rolled fragment of vesicular basalt, were brought up from the great depth of 450 feet.

Western Coast Deposits.—Professor Orlebar informs me that underlying the regur, at Baroche, on the western coast, are beds of a yellowish-brown micaceous sand imbedding nodules of kunker, extending so far inland as Ahmednugger and Deera. They rest on trap, granite, and a sandstone resembling that of Badami. No organic exuviæ were found in these deposits.

Deposits in the Valleys of the Bima, Kistna, Tumbuddra, &c.—In the valleys of the Bima, the Kistna, and the Tumbuddra, and other large rivers, are occasionally seen beds of alluvial gravel elevated beyond the highest existing inundation lines. Some of these deposits may be ascribable to shifts from time to time in the course of the river's bed; a few to the action of rain in bringing down alluvium from the mountain sides; but the majority appears to have been accumulated under conditions not now in existence; probably, during the slow upheaval of the Western Ghauts and plateau of the Deccan, when the water occupied a much greater extent than at present. In many places the rivers have cut their way through these deposits; in others, channels exist of rivers, where now, as in the *Bahr bila maieh*, in Egypt, no water flows, or but a diminutive streamlet.

Captain Allardyce, a most intelligent and accurate observer, informs me that the Moyar valley, which runs along the table land of Mysore by the base of the Nilgherries, differs entirely from a common mountain glen. Though a mile or more in breadth at some points, yet, it is rather a ravine, or fosse, cut in the plain and not hemmed in by mountains. It opens out into the lower plain of the Carnatic, at the Gujulhutty Pass: the sides are precipitous, and its bed very much like the deserted channel of a river. The only stream now flowing in it is the Moyar; which, even in the monsoon, does not fill one hundredth part of its breadth and heighth: yet, this singular excavation, extending some thirty miles in length, is unquestionably a waterworn channel. It is no fissure; for its bed is quite solid and connected, and composed of strata of the hypogene rocks.

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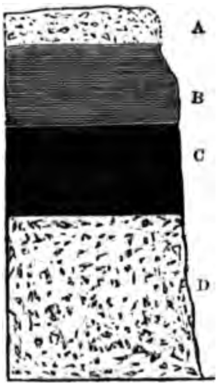
[1] Madras Journal of Literature and Science, for April, 1838, pp. 475 and 476.

Gravel on summit of Nilgherries.—On the summit of the Nilgherries, at an elevation of above 6000 feet from the sea's level, Captain Allardyce informs me that he observed traces of a diluvial current. He states that the gravel and loam there are arranged in such a manner as could only take place by deposit from water; the gravel being lowest, in a thin, distinct, and separate stratum, with the lighter loam covering it to the thickness of several feet. Benza mentions[1] having picked up at the base of these mountains, near Motipollium, a fragment of black mountain limestone, a rock which is not to be found *in sitû* within hundreds of miles. The brooks, even on the summits of the Koondahs, are seen threading their way through beds of alluvium which they could not have deposited under existing conditions.

Nellore, Pondicherry, and Madras Marine Alluvium.—Pondicherry stands upon an alluvium resting on beds of dark blue, or grey marine clay, which extend inland nearly to the base of the Red Hills. The following is a section afforded by a recently sunk well in the town.



A Is a layer of a reddish brown sandy soil two feet thick.

B A bed five feet thick of a blackish clay mingled with a small quantity of grit, and containing existing marine shells.

C Bed of black clay almost pure, also five feet thick.

D Beds of reddish quartzose sand, about ten feet thick.

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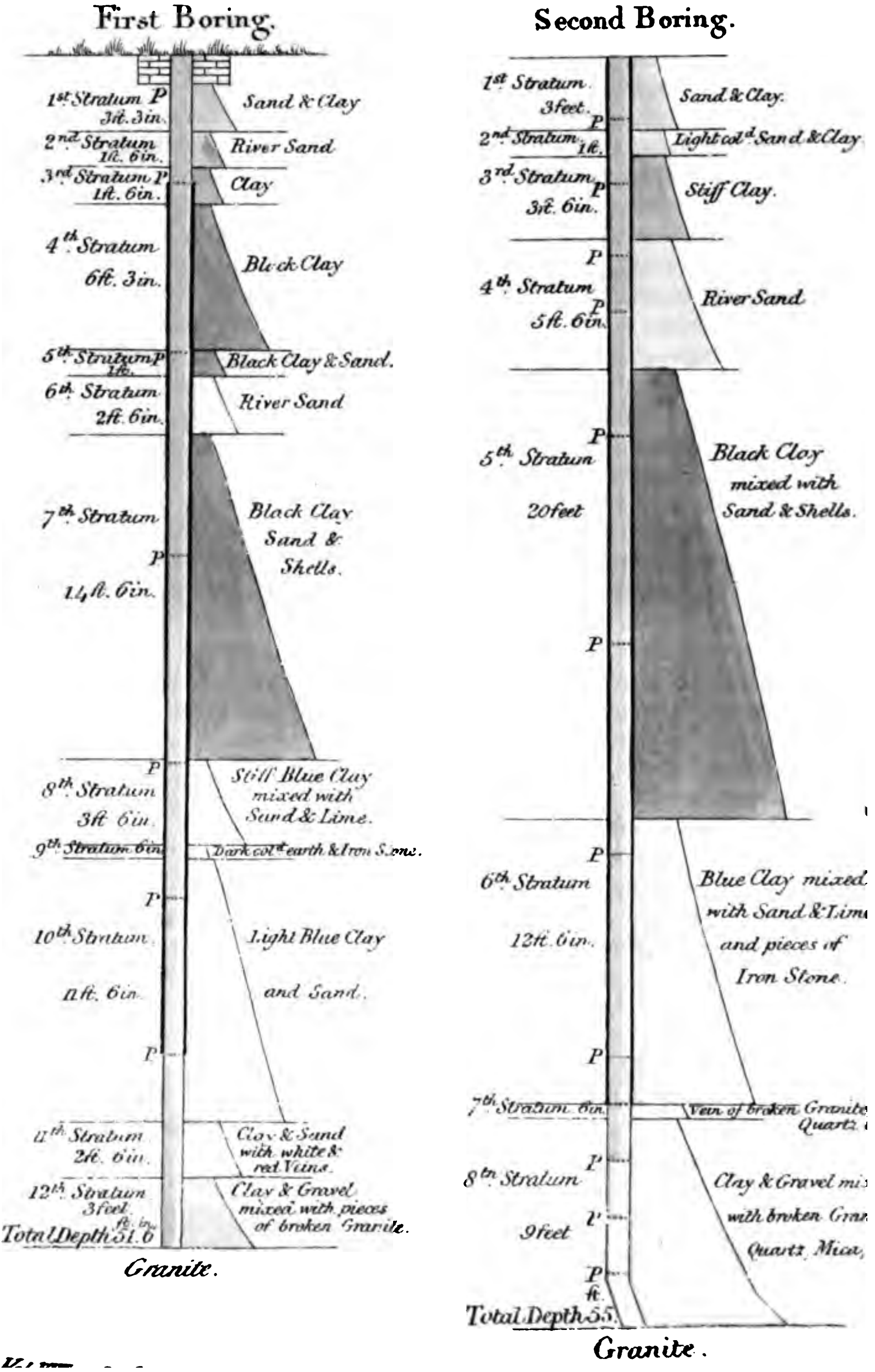
[1] Madras Journal of Literature and Science, Vol. IV., p. 27.

Sections of Two Experimental Borings of the Earth at the Land Custom House, Madras. Executed by Order of Government in Octr. & Novr. 1832.



Near Cottapuram and Kistnapuram south of Nellore I found similar beds of marine clay underlying the alluvial sand. The water percolates through the loose texture of the arenaceous stratum and collects in hollows in this impervious clay bed below, forming the reservoirs down to which the generality of the wells are sunk. As might be expected, the water is, in general, slightly brackish.

I have observed in other localities on the Coromandel coast beds of this dark clay, at depths of from twelve to twenty feet below the present sands and alluvium, imbedding existing marine shells, and extending inland, sometimes two or three miles. On the alluvium covering them, stand Hindu villages, pagodas, and ruins of high antiquity. Over one of these marine beds the greater part of the European portion of the city of Madras is situated, separated by a bed of sand, clay, and soil, from five to fifteen feet thick. South of Madras, beyond the Adyar river, this dark-coloured clay abounds so much in large and thick beds of marine shells, that it is covered with excavations made by the chunam-getters of Madras, who use the shells to burn into that beautiful marble-like lime, so great an ornament to the churches and other buildings at Madras. These shells are preferred to those at present thrown on the sea beach, as freer from saline impregnation which makes the chunam liable to crack in drying.

The saline matter has evidently been carried off for the most part by the fresh-water springs or rivulets of the marshy grounds under which the deposit lies, and which was probably a small estuary or inland lake; the surface, even now, is so low as to be mostly under water during the monsoon. Small rolled fragments of carbonized wood between peat and lignite, occur in it.

The lithographed drawing exhibits two sections of the beds on which the city of Madras stands, down to the granite which is found in the deepest, No. 2, at the depth of fifty-five feet,—afforded by borings near the land Custom-house, about three-quarters of a mile inland from the sea. Intervening between the black clay and the granite, will be found first a bed of blue clay mingled with sand, lime, and pieces of "ironstone" (laterite?); and resting immediately on the granite, a bed of clay and gravel mixed with broken granite, quartz, &c. It does not seem at all improbable that the dark clay is identical with the regur. No organic remains, except marine shells, have hitherto been discovered in it.

These marine deposits were elevated evidently during the Post-Pliocene period, by forces which it would appear are not at rest; and, perhaps, like those affecting some tracts along the shores of the Baltic, cause an undulating movement, raising some parts, and depressing others, while some rest stationary.

Of the elevatory movement on the Coromandel coast there can be little doubt, from the decisive evidence of the raised inland marine beds; and it is stated that Masulipatam, once close to the sea, is now nearly a mile inland. The Puranas assert that the whole of this coast has been raised from the bed of the sea. With regard to the last fact, and to the sinking of the coast in certain places, it must be borne in mind that alterations in the configuration of a coast, caused by storms, unusually strong swells, and partial elevations of the sea's bed, will affect other portions of the same coast to which the current may be deflected.

We have now arrived at the traditional and historical period, and I shall proceed to state a few of the cases where what was formerly said to be land is now covered by the ocean.

Mahabalipur.—It is stated in Brahmanical writings that the ancient city of Mahabalipur, (now termed the Seven Pagodas,) about forty miles south of Madras, was anciently overwhelmed by the sea, which now rolls over the greater portion of the submerged ruins. It is supposed by some to have been the Palibothra of Ptolemy, a place of considerable commerce. I was informed by Lord Elphinstone and Mr. W. Elliot, that whenever a storm took place from the seaward, Roman, and occasionally Chinese coins were cast upon the beach. One of the former, according to Mr. Norton, is of the reign of Valentinianus. General Fraser informs me that south of these ruins, at Ariacoopang and Cuddalore, pieces of brick, tiles, and pottery are taken up from the bed of the sea at considerable distances from shore, beyond the recoil of the tidal wave. Still further south, near the embouchure of the Cauvery, the Brahmans point out the submerged site of another ancient city. At Madras, from all I can collect from the oldest inhabitants and survey, the sea has certainly encroached latterly on the ground it formerly occupied: while St. Thomé, an ancient Portuguese settlement, a little south of Madras, is traditionally said to have stood twelve leagues inland[1].

Adam's Bridge.—The celebrated ridge of rock called Adam's bridge, which the Brahmans (confirmed by the records of the Pagoda at Ramisseram) assert, formerly connected Ceylon with the peninsula of India, and believe to have been miraculously constructed by Rama, is now submerged at high water, having been broken through by a storm in the fifteenth century. The rock of which this ridge is composed is of a loose sandstone, imbedding fragments, apparently of existing marine shells, and formed at no distant period part of the bed of the sea. It is connected with beds of a similar rock on the continent, and on Ceylon. The natives believe that the whole of the adjacent low country of Ramnad has risen from the ocean, to the extent of seventy miles inland.

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[1] Sousa's Portuguese Asia, Tom. I., p. 270.

Malabar Coast.—Indications exist of the sea having covered certain parts of the Malabar coast to a considerable distance inland. The present town of Barcoor, north of Mangalore, supposed by Rennell and Robertson to have been the Barace of ancient geographers, and which now stands two or three miles from the sea, is said to have formerly stood on the shore, and its port to have been frequented by large ships from various regions[1]. Some of the cliffs running parallel with the present coast, at some distance inland, have every appearance of having been formerly washed by the sea; and the Brahmans assert, that the whole of the Malabar coast was raised from the ocean for their special use.

Frequent mention of earthquakes[2] may be found in the history of the Malabar coast, which extends from Cannanore to Cochin, about forty-two leagues. In 1784 a strong concussion was felt. "The most remarkable changes are to be found in the vicinity of Cochin. On its north side we find the island Vaypi, which was thrown up by the sea about the the year 1341. The soil upon this new formation resembles that of the flat districts of Malabar, which consists of sea-sand and calcareous matter combined with clay, said to be washed down from the Ghauts.

"The production of this island had so strong an effect on the minds of the Hindus, that they marked the geological phenomenon by commencing from it the new era, termed *Puduvepa* (new introduction). Contemporaneous with the appearance of the island of Vaypi, the waters, which during the rainy season are discharged from the Ghauts, broke through the banks of the river Cochin, and overwhelmed a village of the same name, with such impetuosity as to sweep it away, and formed in that district a river, a lake, and a harbour so spacious, that very large ships can now lie in security on the north-east side of Cochin, where the river runs into the sea."

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[1] We learn from Pliny and Arrian, that Barace was the principal emporium of Indian trade. It was frequented by the ships of the Alexandrine merchants, which sailed from the port of Berenice in the Red Sea, during the south-west monsoon, to Muziris or Mangalore; but in consequence of that place being infested by pirates, they preferred staying at Barace till the beginning of December or January, when they returned to the Red Sea.

[2] Bartolomeo, quoted by Dr. R. Thomson. Madras Journal of Literature and Science for January, 1837, pp. 176, 177.

SUBMERGEMENT OF THE OLD CITY OF CALICUT.

In some places, as on the Coromandel coast, tracts formerly inhabited have disappeared under the sea. The bank on which stood the old city of Calicut (the landing-place of Albuquerque,) a little to the south of the present site, is now buried under the sea; but it does not appear at all clear whether in this, or other cases of submergement, the cause was a sinking of the land, or a change in the configuration of the coast by a sudden rise of the sea. It is said that the remains of an old factory are to be seen in the surf off Purkaad and those of Pagodas in the surf at Tricanapully on the coast of Travancore. The subject is one of much interest, and requires patient and careful investigation. What has been stated above is more with the view of eliciting inquiry than affording solid material for a theory. Marks on cliffs washed by the sea, and registers of the height to which it rises, as adopted on the shores of the Baltic, would be of great use.

Shocks of earthquakes are not unfrequent in the maritime districts of Nellore and Guntoor; and I lately felt one very distinctly, attended with a noise resembling the subterranean rumbling of a train of heavy carriages along the gallery of a mine, on the table land of Kurnool. No volcanoes, either in an active or a dormant state, are known to exist in Southern India, though one occurs in the Andaman islands in the Bay of Bengal.

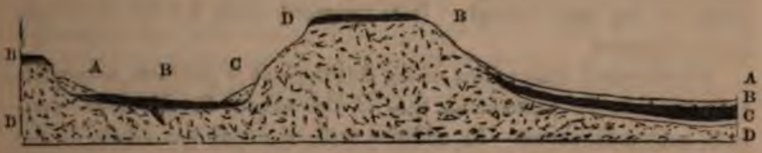
REGUR, OR BLACK COTTON CLAY.

Geographic Position.—This singular deposit covers, in sheets of considerable thickness, at least one-third of Southern India. It occupies principally the elevated table lands of the Ceded Districts, the Hydrabad, Nagpore, and Southern Mahratta countries; including thereby the whole of the plateau of the Deccan. It is less common in Mysore, but is again seen in continuous sheets from six to twenty feet thick below the Salem track, covering the lower plains of Coimbatore, Madura, Salem, Trichinopoly, Tanjore, Ramnad, and Tinnevelly, to the vicinity of Cape Comorin.

It is rarely seen on the maritime plains of the Carnatic, and I have never observed it below the escarpment of the Western Ghauts on the coasts of Malabar, Canara, or Travancore.

Physical Aspect.—The plains occupied by the cotton soil are in general marked by their horizontal sea-like surface and almost treeless aspect. The vegetation which almost characterises it is the shrub *Jatrophus glandulifera*, and the *nuth* grass. It is often covered with bushes of the thorny acacias, cassia auriculata, asclepias gigantea, butea frondosa, &c.

Geognostic Position.—It covers the kunker and gravel beds just described, and is generally seen as a surface soil; but if we examine the edges of great sheets they will generally be found to dip for some distance under the recent alluvium, which conceals and replaces them as a surface soil. It not only covers extensive plains, but the tubular summits of hills overlooking those of the diamond sandstone and limestone, newer trap and laterite formations, far above the present drainage level of the country: it covers all rocks from the granite to the laterite and kunker; and often fills up depressions and chinks in their surface, as seen in the accompanying section. Soundings on a bluish-black clay are obtained in various situations off the Coromandel coast, which closely resembles the régur, as also the blue clay imbedding the marine shells below the cities of Madras and Pondicherry. Part of this deposit, it is not improbable to suppose, may have been derived from the denudation of the régur that once covered the maritime tracts of the Coromandel coast.



A A A Recent detritus and alluvial soil.
B B B B Regur.
C Kunker.
D D D Laterite.

Composition, &c.—The purest regur is usually of a deep bluish-black colour, or greenish, or dark greyish black, fracture varying from shining to earthy, streak brownish, or greenish black, shining; when placed in water it crumbles slowly with emission of air bubbles, and forms a tenacious paste; when moistened it gives out an argillaceous odour. Before the blowpipe, *per se*, it melts into a greenish glass, or dark slag. Mr. Reid fused some of it in a large covered crucible placed in a furnace into a solid mass, on the surface of which a crust of oxide of iron formed. A chemical analysis made by my friend Dr. Macleod afforded the following result.

Silex	48	2
Alumina	20	3
Carbonate of lime	16	0
Carbonate of magnesia	10	2
Oxide of iron	1	0
Water and extractive	4	3
	100	0

The quantity of iron it appears by this analysis is not sufficient to account for the black colour of this soil, which may be partly attributed, as in the case of the Cuddapah limestone, to the extractive or vegetable matter it contains. The regur of Trichinopoly, I am informed by Captain Allardyce, does not fuse, and contains imbedded crystals of pure mineral carbon, which are converted before the blowpipe into a white ash. There is, no doubt, nearly as great a diversity of composition in the regur deposit, as we find in other equally extensive aqueous rocks.

The best kinds of this extraordinary soil are rarely suffered to lie fallow, except by accident, and never receive manure, which is even supposed to lessen its fertility. It has yielded annually, crop after crop for upwards of 2000 years (usually in triennial rotation) of cotton, juari, and wheat, or bajri, without receiving any aid from the hand of man, except an annual scratching with a small plough, and a decennial, or still more seldom, clearing of the nuth grass by means of the large plough. It is irrigated solely by the dews and rains of heaven.

The chemical composition of the cotton plant it produces, somewhat assimilates in its ingredients that of the soil, as Dr. Macleod's analysis, subjoined, shows. In addition will be found the alkali of the vegetable, and the muriate of soda, which, as well as the carbonate, are frequent accidental ingredients in the composition of the regur. They sterilize it when present in large quantities. The proportion of silex in the cotton plant, as might naturally be expected, is much less, and the alumina is altogether wanting.

Silex	7	0
Alumina	0	0
Carbonate of lime	45	6
Carbonate of magnesia	25	0
Charcoal, oxide of iron, and loss	5	2
Carbonate of potass	10	6
Muriate of potass and soda	6	6
	100	0

The regur is remarkably retentive of moisture; a property to which is ascribable much of its fertility, since it has been ascertained by the experiments of Sir Humphry Davy that the absorbent power of many soils with respect to atmospheric moisture are greatest in the most fertile soils. He dried[1] 1000 parts of a celebrated soil from Ormiston in East Lothian, by a heat amounting to 212° Fahrenheit, and found that by one hour's exposure to air saturated with moisture at a temperature of 62° it gained 18 grains. Dr. Christie thoroughly dried a portion of régur by a heat nearly sufficient to char paper. He then exposed to the atmosphere of a moderately damp apartment 2615·6 grains of it, and found after a few days it had gained 147·1 grains. He now exposed it to an atmosphere saturated with moisture, and found that the weight increased daily till the end of a few weeks, when it was found to be 2828·4 grains. The soil had therefore gained 212·8 grains, or about 8 per cent.

During the dry season, when the crops are off the ground, the surface of regur, instead of presenting a sea of waving verdure, exhibits the black drear aspect that the valley of the Nile puts on under similar circumstances, and which powerfully reminded me of the régur tracts of India. Contracting by the powerful heat of the sun, it is divided, like the surface of dried starch, by countless and deep fissures, into figures usually affecting the pentagon, hexagon, and rhomboid. While the surface for a few inches in depth is dried to an impalpable powder raised in clouds by the wind, and darkening the air, the lower portions of the deposit, at the depth of eight or ten feet, still retain their character of a hard black clay, approaching a rock, usually moist and cold; when the surface dust, as I have proved, has a temperature of 130°. In wet weather the surface is converted into a deep tenacious mud.

Over the vast and fertile table lands where this soil prevails, rice, the staple article of food on the maritime and low tracts, is no longer, or but seldom, used by the lower classes, and cakes of wheaten flour, or of that of the juari and bajri are substituted.

The purest beds of regur contain few rolled pebbles of any kind; the nodules of kunker we see imbedded have probably been formed by concretion from the infiltration of water charged with lime; and it is only near the surface that the regur becomes intermingled with the recent alluvium of the surrounding country, or in its lower portions where it becomes intermingled with the debris of whatever rock it happens to rest on,—trap and calcedonies in trappean districts; granite, sandstone, pisiform iron ore, and limestone, in the plutonic and diamond sandstone areas. It sometimes exhibits marks of stratification: in Gujarat, Professor Orlebar informs me, the regur is distinctly stratified; and a writer on the Geology of the Hydrabad country, in the Madras Literary Transactions, (Part I, p. 82) observes, that the cotton soil there varies in depth from a few feet to many fathoms; and that it is generally found distinctly arranged in strata, which are sometimes separated by thin layers of sand or gravel. These strata, he observes, vary in thickness; they are sometimes horizontal; in other instances waved, or more or less inclined to the horizon.

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[1] Madras Journal of Literature and Science, for October, 1836, p. 472.

Organic Remains.—No organic remains have hitherto been discovered in the regur, except a few fluviatile exuviæ on the banks of rivers, and land shells, all of existing species.

Origin.—Drs. Voysey and Christie, chiefly from the circumstance of the regur fusing into a dark glass and slag resembling the trap, and its dark colour, and its embedding minerals from the trap formation, are of opinion that it arose from the weathering of trap rocks.

In a paper read before the Bengal Society, in March, 1838, I stated my reasons for venturing to question the accuracy of this theory. They are briefly these,—that the trap rocks of India never weather into a black soil, but are seen every where to disentegrate into a red, brown, light or rust-coloured earth and detritus, as the protoxide of iron they contain, by exposure to the air, becomes converted into the peroxide, like a piece of iron which first blackens, and then rusts, on exposure.

The depth, extent, and situation of the sheets of regur, often far above the beds of existing rivers, and out of the reach of their greatest inundations capping both the tabular summits of hills, and the plains at their base, preclude the supposition of its being a fluviatile deposit as thought by Voysey. Besides, I found that the deposit of the large rivers running through the great regur tracts of the Deccan, viz., those of the Bima, the Kistna, and the Tumbuddra, differed widely from the regur, consisting principally of a reddish-brown silt, mud and sand, containing calcareous matter, partly deposited in it by calcareous springs, and partly the detritus of the beds of limestone and kunker, over which the course of the river occasionally passes. This silt and sand deposit sometimes acquires a dark hue from the admixture of the regur itself, which often forms the banks of these rivers, and which during the freshes are frequently undermined, and washed into the stream.

It is evident from the regur's resting indiscriminately on plutonic, hypogene, trappean, and aqueous rocks of widely dissimilar chemical composition, with some of which it exactly agrees, that it cannot be the result of the weathering of these different rocks, *in situ*, nor can its present elevated situation on these rocks be accounted for by fluviatile, or other transporting powers now in action. Its lying under all present alluvia is indicative of its greater relative age.

Its mineral composition, colour, the horizontality of its surface, cracked by countless fissures, assimilates more the black vegetable deposit we often see in the tanks of India, or the dark flat mud deposits of the Nile, which, like the cotton soil, I found to melt before the blowpipe into a greenish glass or enamel, to fall to pieces in water with emission of air bubbles, forming a tenacious clay, and to contain a considerable quantity of calcareous matter.

The components of the Nile deposit are the same precisely as those of the regur, as will be seen by the subjoined analysis by Regnault, but the proportions are different. That of the lime is nearly the same same in both. The mud of the Nile would appear to contain much more aluminous and less siliceous matter than the regur, but the proportions I found in both deposits to differ in different localities.

Mud of the Nile.

Silex	4	0
Alumina	48	0
Carbonate of Lime	18	0
Carbonate of Magnesia	4	0
Oxide of Iron	6	0
Water	11	0
Carbon (or extractive)	9	0
	100	0

The mud of the Nile is supposed to obtain most of its vegetable or carbonaceous matter from the overflowing of the great marshy lakes that lie stagnant on the table lands of Abyssinia during great part of the year. I have never been able to discover organic remains in it, nor have I heard of such being found, save pebbles from the subjacent shell limestone, and a few existing fluviatile and terrestrial exuviæ.

That the regur of India is an aqueous deposit from waters that covered its surface to a vast extent, I have little doubt: but it would be as difficult to point out at the present day the sources whence it derived the vegetable matter, to which in great measure it owes its carbonaceous colour, and the rocks, from the ruins of which its remaining components were washed, as to indicate the locality of the continent from the vast debris of which the Wealden beds were formed, and by the drainage of which a great river was supplied.

Shortly previous to my leaving England in 1842, I was present at a Meeting of the Geological Society, at which a specimen of the black soil, the *Chernoi zem*, that covers many of the steppes of Russia, and brought thence by Mr. Murchison, was exhibited, when both Mr. Lonsdale and myself were struck with the external resemblance this deposit bears to the regur. Its geological position and distribution also appear to be similar.

Kunker Formation.

It is probable that the calcareous deposit termed *Kunker*, a Hindustani word (کنکر), but of Sanskrit extraction, signifying a nodule of limestone, or a pebble of any other rock, had an earlier origin than the laterite and some of the marine alluvial beds just described: but since it has not, as yet, been found underlying them as a separate and distinct bed, without penetrating into their substance, it will be best for the present to assign it a place between them and the regur—that is, its earliest deposits; since the process by which it was originally formed, although now less active, perhaps, than in former epochs, has not altogether ceased. There will be always some difficulty in distinguishing between the kunkers of different eras, the recent deposit differing little from the ancient in chemical composition, but being generally of a whiter colour, softer, and of a more cancellar structure.

Geographical Position and Extent.—The kunker formation is irregularly distributed in overlying patches over perhaps one-eighth of our area. I know of no tract entirely free from it, with the exception, it is said, of the summits of the Nilgherries. I have seen it, however, at the height of 4000 feet above the sea among the ranges on the elevated table lands. It is most abundant in districts penetrated and shattered by basaltic dykes, and where metallic development is greatest: for instance, in the copper district of Nellore, and the chrome and iron tracts of Salem. It is, perhaps, least seen in localities where laterite caps hypogene or plutonic rocks.

Geognostic Position.—It occurs filling, or partially filling, fissures and chinks in the subjacent rocks, in nodular masses and friable concretions in the clays and gravels above the rocks, and in irregular overlying beds, varying from a few inches to forty feet in thickness. It has been found at the depth of 102 feet below the surface of the surrounding country, prevails alike in granite, the hypogene schists, the diamond sandstone and limestone, and in the laterite: hence, the springs which deposit it must bring up their supply of calcareous matter from sources deeper beneath the earth's crust than the diamond limestone.

Lithologic Character and Imbedded Organic Remains.—The older kunker is usually of a light brownish, dirty cream, reddish, or cineritious grey tint; sometimes compact and massive in structure, but more usually either of a nodular, tufaceous, pisiform, botryoidal, or cauliflower-like form. Its interior is sometimes cancellar, or slightly vesicular; but compact or concentric in the pisiform and nodular varieties. Its interior structure is rarely radiated. When compact it resembles the older travertines of Rome and Auvergne. It aggregates in horizontal overlying masses, usually intermingled with the soil without much appearance of stratification. It is broken up, and used as a rough building stone in the bunds of tanks, walls of inclosures, &c., by the natives, and is universally employed to burn into lime.

A specimen of kunker, analysed by the late Mr. J. Prinsep, yielded,

Water of absorption . . .	1	4
Carbonate of lime . . .	72	0
Carbonate of magnesia . . .	0	4
Silex	15	2
Alumina and oxide of iron . .	11	0
	100	0

Some varieties contain so much silex as to give fire with steel: others are almost entirely composed of earthy white carbonate of lime, and crumble between the fingers.

Organic Remains.—No organic remains have hitherto been discovered in the ancient kunker of Southern India; but in the modern kunker I have seen pottery, bones of recent mammalia, fragments of wood, existing land and freshwater shells, Paludinæ, Helix, Planorbis, and Ampullaria, imbedded.

In the banks of rivers, it is often seen concreting in stalactiform masses round the stems and roots of grasses, which, decaying, leave casts of carbonate of lime. This lime held in solution and suspension by existing streams, mingling with the fine particles of sand and ferruginous matter in suspension, sets under water like pozzolana; and, uniting the shells, gravel, sand, and pebbles in the bed, and on the banks, forms a hard and compact conglomerate.

Origin.—The kunker, as may have been collected from what has been just stated, is not of zoophytic origin like coral reefs; nor does it appear to have been generally deposited, or chemically precipitated, from the waters of an ocean or inland lake: but, like the travertines of

Italy, it may be referred to the action of springs, often thermal, charged with carbonic acid, bringing up lime in solution, and depositing it as the temperature of the water gradually lowered in rising up to the earth's surface, or in parting with their carbonic acid.

After depositing a portion of calcareous matter in the fissures of the rocks by which it found a vent, the calcareous water appears to have diffused itself in the loose debris, regur, gravels, and clays usually covering the rocks; and, by force of chemical affinity, the disseminated particles of lime gradually congregated into the nodular, and other forms we see them assume. These nodules are sometimes arranged in rows like the flints in chalk; and from some of them project delicate spiculæ of carbonate of lime, which would have been broken off had they been drift pebbles, as supposed by some.

If we compare the calcareous matter found in the fissures of the rock with that of the nodules above deposited by the same spring, we generally find the former in a much purer state, and more friable than the latter, which, by being disseminated among the detritus above has, as previously remarked, become mingled with such proportions of siliceous and ferruginous matter as to assimilate in composition some of our hydraulic cements: hence its disposition to consolidate and harden in moist clays, sands, and detritus. The dissemination of the calcareous particles among heterogeneous earthy matter would appear favourable to their aggregation by mutual attraction, in a nodular or concentric form, round the nucleus of a grain of sand, or blade of grass. Some of these nodules and spheroids may be regarded, perhaps, as exhibiting approaches to crystallization,—in fact, crystalloids: the interior structure, particularly of the pisiform variety, is frequently crystalline, and exhibiting no traces of mechanical concentric accumulation round a nucleus.

The structure of the kunker formation may be generally termed, therefore, concretionary, like that of some varieties of magnesian limestone. But there is this striking distinction in the kunker, viz., the absence of the laminæ and lines of original deposition that pass uninterruptedly through those of concretions in the magnesian limestone: hence the inference that the concretionary structure in the latter took place subsequent to deposition; and in the kunker that the deposition of the lime must have taken place under different circumstances, and that the aggregation of its molecules was almost contemporaneous with the exercise of the force which drew them into a concretionary structure. It is evident that both mechanical laws and those of crystallization have influenced the various aspects under which we see this singular rock.

Dr. Christie[1], who was of opinion that the regur was the result of the decomposition of the trap rocks, as already alluded to, thought that the kunker, from its being often associated with it, owed its origin to the calcareous spar of the trap rocks. The kunker, however, as we have seen, may be observed in the process of being deposited by springs rising through granite, gneiss, hornblende, limestone, and sandstone rocks, in areas where not a trace of the newest trap, or even of the older trap, which rarely contains calc spar, is to be seen. The small quantity of lime that enters into the composition of hornblende and augitic rocks is infinitely too minute to account for the prodigious development of this concretionary limestone seen all over India.

Age.—I have already alluded to the difficulty of fixing the period at which kunker was first deposited; and the formation is still going on, imbedding fragments of the oldest rocks with those of the most recent, and daily adding to the deposit both on the land and in the bed of the ocean, into which large quantities of calcareous matters are poured by the springs which empty themselves into the great lines of drainage.

The facts of the kunker never having been observed to form a regular bed on which another deposition has taken place lower than the regur, its never being divided by any of the veins or dykes in any of the rocks described, and being undisturbed and unaltered by the overlying trap, which we have seen breaking up and converting into chert the freshwater limestones of Nirmul, and the few shells it imbeds being all of existing species, induce me to place it in the new or pliocene epoch, which includes those of the recent, or human period. It is probable that its earliest appearance took place at an era anterior to this, but there is no decisive evidence of its being older than the newer pliocene travertins of Rome, which imbed the existing land and freshwater shells of the surrounding country and the remains of the mammoth.

Rock Basins, &c.—In a Paper read before the Geological Society, in 1841-1842, I communicated some observations on the occurrence of Rock Basins, the Giants' Cauldrons of the Scandinavian Mountains, in the rocks of Southern India, at elevations beyond the reach of present floods; and others in the rocky beds of rivers evidently eroded by the action of present streams, which closely resemble those described by M. Agassiz, on the sides of the valleys of the Alps, and like them pass into spoon-shaped excavations, and into successions of cavities connected by narrow channels in the rock. M. Agassiz, from the circumstance of many of the cavities occurring in rocks remote from the influence of modern running waters, and observing that similar cavities and channels are now in process of excavation by the streams of water which flow along the surfaces of glaciers, and then fall into fissures which are open to the bottom, conceived them to be evidences in favour of his glacier theory, as confined to these icy tracts: but in the paper above alluded to, I think I have satisfactorily proved the fact of their being caused in the rocks of the Tumbuddra and other streams of Southern India, where ice is unknown, by the waters that now roll over them; and consequently, that a glacier is not an indispensable condition to the production of these singular cavities, which I have also observed in the granite rocks in the heart of the desert of Mount Sinai, and in the limestones of Egypt, Sicily, and Malta, easily distinguished by their regular form and contour from the perforations of lithodomi.

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[1] Madras Journal of Literature and Science, for October, 1836, p. 470.

The parallel striæ and scorings (*diluvial schrammen*) so remarkable on the mountains of Northern Europe, adduced by Sefström as evidences of a vast ancient flood, caused by the abrasion of pebbles swept over the surface by aqueous currents, the polished surfaces and grooves so generally received in Europe, on the authority of Agassiz, Charpentier, and others, as unquestionable evidence of the overland march of glaciers, carrying with them boulders, gravel, and sand, which are often impacted in the ice, like particles of sand in sand-paper, and scratch or polish the subjacent rocks, have escaped the notice of Indian geologists. A few grooves occur on the surface of the granitic bosses that rise from the surface of the sandy waste that marks the confluence of the Hogri with the Tumbuddra; but these have the appearance of having been worn by the action of the present floods; they are chiefly from one to two inches in breadth, coinciding with the diameter of the generality of the pebbles found in the river bed, and their direction runs parallel with that of the stream by which they are covered during the monsoon. The depth of the furrows varies, and in some places has been influenced by the hardness or softness of the parts of the rock. A few tough quartz veins have been much less worn than the imbedding rock, and are seen standing out, in high relief, from its surface: some, indeed, have even formed barriers, but slightly worn, across the furrows.

Some grooves occur on the surface of the limestones of Cuddapah, Kurnool, &c., but they appear to me to have been caused by the unequal decay or weathering of the rock.

PART VIII.

MODERN ALLUVIA AND SAND DUNES.

WHERE regur does not prevail, the ordinary soils of Southern India are distinguished by a reddish tinge, owing to the great prevalence of oxide of iron in the rocks of which they are, in great measure, the detritus. Patches of white soil occur, and are usually the consequence of the weathering of beds of quartz, or composed of kunker, which abounds so generally, and enters into the composition of almost every variety of soil. These white soils, it is almost unnecessary to remark, are characterized by sterility.

In tracts of country shaded by eternal forests, for instance the Ghauts, and sub-Ghaut belts, a dark vegetable mould prevails,—the result of the successive decay and reproduction of vegetation for a series of ages, under the stimulating alternations of excessive heat and moisture; in such regions, where unsheltered by forest, and in exposed situations, the soil is either lateritic or stony according to the nature of the subjacent rock.

The substratum of the modern soils of Southern India is usually either a bed of kunker, or the parent rock, with an intervening layer of rubble, composed of its own broken up, and angular fragments of the subjacent rock, often called *Mhurrum* by the natives.

At the bases of mountain ridges we usually find an accumulation of large angular blocks composed of the same rocks as the hills down whose declivities they have rolled in weathering; at a greater distance from the base in the plain these are succeeded by pebbles, whose reduced size, mineral composition, and worn angles proclaim them to have travelled from the same source, diminishing in bulk the farther we recede from the mountains, until they pass, by the gradations of grit and sand, into deposits of a rich clay or loam. Such are the gradations generally to be traced in the modern rock alluvia, and which strikingly distinguish them from the vegetable soil of the forest tracts and the regur, which are often seen in the state of the greatest richness and fineness of composition at the very bases of the hills, and resting immediately on the solid rock.

The alluvia brought down by the streams from the Western Ghauts, flowing easterly to the Bay of Bengal, are usually composed of silt, sand, and gravel—detritus of the rocks over which they have passed: they almost always contain a considerable portion of lime derived from the springs which supply them, and from the limestone and kunker beds over which most of them flow. The alluvia of the rivers of the western coast are of a more carbonaceous, and less calcareous character, owing to the greater absence of lime in the formation, and the dense forests and luxuriant vegetation which almost choke their passage.

During the hot season, when the surface of the alluvial sand in the beds of the rivers and rivulets is perfectly dry, a stream of clear water is frequently found at various depths below them, stealing along or lodging in the depressions of some impervious layer of clay or rock, to which it has sunk through the superincumbent sand. So well is this fact understood by natives, that in arid, sandy tracts, where not a drop of water is to be seen, they will often be enabled to water whole troops of horse and cattle by sinking wells a few feet deep, through the sands of apparently dried-up rivulets. I have observed similar accumulations of water at inconsiderable depths below the surface of the sands of the Egyptian deserts, which the wandering Bedouin is as keen to take advantage of as the vagrant Brinjari of India.

The benefit resulting from the admixture of lime into soils consisting almost solely of vegetable, siliceous, or argillaceous matter, is too well known to be dwelt on here; and it is a remarkable and bountiful provision of nature in a country like Southern India, where limestone is so rarely seen in the rocks from which a great part of its soil is derived, that innumerable calcareous springs should be constantly rising through the bowels of the earth to impregnate its surface with this fertilising ingredient.

In many parts of the Ceded Districts, where the surface soil has been of a gravelly sterile nature, I have seen it covered with little conical heaps of the subjacent rich black regur, thrown up there by the subterraneous workings of a small insect of the ant species.

The alluvia of Southern India are remarkable for their saline nature. The salts by which they are impregnated are chiefly the carbonate and muriate of soda, which prevail so much, (particularly in mining districts,) as to cause almost perfect sterility. The carbonate appears on the surface covering extensive patches, in frost-like efflorescences, or in moist dark-coloured stains, arising from its deliquescence in damp weather, or by the morning dews.

Where such saline soils are most prevalent there will be usually a substratum of kunker, or nodules of this substance, mixed with the soil: and there can be little doubt, I think, that their origin may be referred to the numerous springs rising through the fissures or laminæ of the subjacent rocks, some charged, as already noticed, with carbonate of lime, and others with muriate of soda and sulphate of lime. The carbonate of soda, like the natron of Egypt, is the result of a mutual decomposition of the muriate of soda and carbonate of lime, by a natural chemical process so satisfactorily explained by Berthollet. It may be as well to remark that muriate of lime is invariably found in the saline soils of India, and which are known to the natives by the terms of "soud" and "jairi." The soda soil is used by the *dhobis*, or washermen, to wash clothes with, and hence called in Hindustani, *dhobi ki matti*, washerman's earth: it is also employed by the natives in the manufacture of glass.

Both the carbonate and muriate of soda are found mingled in varying proportions, in white efflorescences, in the beds and on the banks of springs and rivulets.

Nitrous Soils.—Soils impregnated with nitre I have seen only on and around the sites of old towns, villages, &c., and other localities occupied by man or beast, though they are said to occur in the deserts of Ajmere, and other localities remote from the impregnation of animal matter. In Egypt I observed that the richest nitre soils were invariably procured from ,the sites of old cities, Luxor, Carnac, Dendera, Sakára, Memphis, Ghizeh, Old Cairo, &c., and it appears to me that the abundance of nitre for which the soil of Egypt has so long been famous, is, in great measure, owing to so enormously dense a population being confined to the narrow belt of cultivable soil deposited by the Nile.

Here a vast quantity of animal matter must gradually have been blended with the calcareous and vegetable soil: from their decomposition the elements of new combinations, by the agency of new affinities, are generated;—nitrogen from the animal, and oxygen, &c. from the vegetable matter. The nitric acid thus produced combines with the vegetable alkali, forming the nitrate of potass, while its excess, if any, combines with the lime, forming a deliquescent salt,—the nitrate of lime. The affinity lime has to nitrogen and oxygen materially assists the formation of the acid by their combination.

The natives of India, in their rude manufactories of saltpetre, act upon these principles without being aware of their rationale. Having collected the earth from old ruins, or from places where animals have been long in the habit of standing, they throw it into a heap mingled with wood ashes, old mortar, chunam, and other village refuse; and allow it to remain exposed to the sun's rays and to the night dews for one or two years, when it is lixiviated. The salt obtained is not very pure, containing either the muriate and sulphate of soda or potash, or nitrate and muriate of lime.

Moisture and a certain degree of heat appear to be necessary conditions to the production of nitre in soils; hence its comparative rarity, in the natural state, in the soils of countries remote from the heavy dews and heats of the tropics; South America, Africa, Persia, and India, are the countries where it most abounds. It has, however, been found so far north as Hungary and Spain. Even in the artificial nitre beds of Europe much heat is evolved in the fermentation of the decomposing animal and vegetable matter of which these composts are formed.

The presence of animal matter is thought by some not essential to the formation of nitre, since it has been found encrusting the interior of caverns where no trace of the former has been found. The Pulo of Molfetta, in the Neapolitan dominions, is a deep cavity formed by the falling in of several caverns; and, when the Abbé Fortis first drew public attention to it, it was lined with a crust of nitre an inch thick; which, on being scraped off, was successively renewed in a few days. In Ceylon[1], a cavern near Mensoora, in the district of Doombera, in a decomposing rock consisting of calcspar, felspar, quartz, mica, and talc, in a humid state, exposed to the air, and perfectly free from any animal matter, contains a rich impregnation of nitre. It also occurs in the limestone caverns of Kentucky in North America. It would appear in these cases to be deposited like stalagmitic encrustations of lime by water percolating through fissures in the rocks forming the sides and roofs of the cave, and these waters have not hitherto been traced to the source; and it is very probable they may have arrived at these nitrous caves impregnated with saline matter derived from beds of animal remains in other caves occupying a higher level. Another source of potass, where such depositions occur in felspar rocks, as in Ceylon, may be traced to the decomposing felspar itself, which contains from twelve to fourteen per cent of potass.

Nitrous soils are easily recognised both in Egypt and India by the dark moist-looking patches which spread themselves irregularly on the surface of the ground, and, by capillary attraction ascend walls of considerable height. They are more observable in the morning before the sun has had power to dissipate the dews.

Sulphuriferous Alluvia.—Soil impregnated with sulphur occurs in a low situation in the Wodiapollum jungle, south of Wolandurpett,

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[1] Davy's Account of the Interior of Ceylon, 4to., p. 32.

South Arcot. The specimens I have seen of this soil were of a dark greyish colour, consisting of a number of fine particles of earth, like those of a sediment from water, agglutinated in small friable lumps, which, on being broken, exhibited minute yellow spiculæ and crystals of sulphur. The natives inform me that after a fall of rain the sulphur is apparent on the surface of this deposit.

Another deposit, according to Heyne, occurs in the Northern Circars, not far from Madapollam, in the bed of a shallow marine lagoon connected with the Godavery, at a place called Saura sanyáveram, about twelve miles east from Ammalapoor. This lake has a most disagreeable smell: the sulphur is found in its deposit at a depth never greater than a foot below the surface of the mud, in semi-indurated nodules of a greyish yellow colour, which exist in considerable abundance. This saline sulphureous lake is of recent origin: fifty years ago it was a cultivated field. The soil is the black cotton regur mixed with decayed vegetable matter, and the water covering it is impregnated with the usual salts of sea-water.

Dr. Malcolmson has the merit, I believe, of having first suggested the hypothesis of the sulphuretted hydrogen in the saline lakes being originated by the decomposition of the sulphates in the water by the carbonaceous matter of vegetables, a theory the truth of which has been tested and found correct by Professor Daniell, in his investigation as to the causes of the rapid decay of the copper sheathing of ships employed on the Western Coast of Africa, which was so remarkable as to attract the notice of the Lords of the Admiralty; and which he has satisfactorily shown to be ascribable to the sulphuretted hydrogen which is spontaneously evolved in large quantities from the waters of the rivers on the coast; and to which the deadliness of these tracts may be, in great measure, attributed.

There can be no doubt that sulphuretted hydrogen has been similarly generated in the lagoon in the Northern Circars, viz., by the decomposition of the sulphates of the sea-water by the vegetable matter of its bed, and that the sulphur, of which sulphuretted hydrogen contains more than ninety-four per cent., has been deposited either by atmospheric exposure on the drying up of the water in the hot season, or by the hydrogen being set free by a new force of chemical affinity. It is a well known fact that water impregnated with sulphuretted hydrogen deposits its sulphur on exposure to the air. In the decomposition of a gas, or miasma, so deleterious to life, by contact with the air we breathe, we may behold the benevolent finger of Providence; still, in some cases, as on the baneful Western Coast of

Africa, the generation of the gas goes on in a disproportionate ratio to its decomposition.

Many of the salt and fresh-water lakes and marshes on the coasts of Southern India emit fetid odours of sulphuretted hydrogen during the hot weather, and it is probable that sulphur will be found deposited in their muddy bottoms.

I have seen sulphur encrusting crevices in the lava walls of the craters of Etna and Vesuvius, dug out in large crystals from the Solfatara near Naples, and in detached nests in the limestones of Egypt and Sicily, and the gypseous rocks of Conil, near Cadiz. It also occurs in the hot volcanic springs of Iceland, and has been found in detached masses in cavities in quartz veins in the mica slate, composing the Ticsan mountains in South America. In all these cases it appears to have originated by sublimation by active or extinct volcanic or thermal heat from below. Its occurrence, as a deposit, originating in the decomposition of salts held in aqueous solution by carbonaceous matter, is interesting and instructive.

Auriferous Alluvia of Rivers.—The alluvium brought down by the rivers flowing easterly towards the Bay of Bengal is usually silt, sand, or calcareous matter, detritus, as before observed, of the rocks over which they pass; while that of the rivers flowing westerly is of a more carbonaceous character. Most of these alluvia are auriferous, particularly those of the Malabar and Canara coasts. Grains of gold are found in considerable abundance in the alluvial soils of Mysore, Malabar, &c., and in those of the Kupputgode range in the Southern Mahratta country.

Dunes.—Dunes, or hills of moving sand, are frequent along the Malabar coast, contributing greatly to the formation of those singular lagoons termed backwaters, by obstructing the mouths of rivers, and preventing the free drainage of the country. The water brought down by the stream from the Ghauts accumulates in a series of lagoons and marshes, extending along the coast in a line nearly parallel with it. The sea occasionally communicates with the fresh-water by breaking over the narrow belts of sand that usually separate them from the ocean, or by bursting through the openings frequently made by the force of the freshes during the monsoon. Hence we find in their beds the shells of the sea mingled and sometimes alternating with the Planorbes, Helices, Ampullaria and Pupas of the land and fresh water.

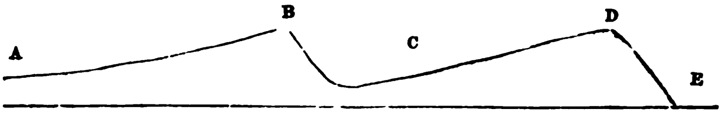
Similar dunes occur on the eastern coast, particularly near the embouchures of the larger rivers,—such as the Godavery and the Kistna. These banks of sand, by their constant shifting, frequently assist the singular changes in the mouths of the rivers effected by the more powerful and direct influence of the sand bars thrown up in the conflict between the river freshes and the tidal wave during the fury of the monsoon.

Sand dunes are not confined to the coasts, but are seen on the banks of the larger rivers in the interior of the peninsula, and on the table lands. During the dry season, the beds of these rivers, deriving but a scanty supply of water from perennial springs, usually present large arid wastes of sand. These are acted upon by the prevailing westerly winds, which blow strongest during the months of June, July, and August, and raise the sand into drifts, which usually advance upon the cultivation in an easterly direction.

At Honoor, in the Ceded Districts, on the banks of the Hogri, about twelve years ago, at a season when the westerly winds were unusually strong, and but little rain had fallen, the dunes invaded and buried land under cultivation, in one year alone, to the extent of more than eight chains, not since reclaimed. The next year they threatened the village itself, and the sand rose in its streets to the height of five feet. The village of Bodúrti, about eight miles distant, was totally buried about thirteen or fourteen years ago. At the time of my visit, in 1839, it was completely covered by the sand drift, with the exception of the tops of the walls. On the banks of the Pennaur, in the Cuddapah district, I have ridden over a whole village overwhelmed by a sand dune: the only indication of its site was the top of an old pagoda projecting from the sand.

The advance of these moving hills is usually very regular where no obstruction presents itself, such as high bushes, trees, hedges, &c., which are often planted by the natives purposely to arrest the progress of these invaders on their cultivated lands. The sand is often held together and retarded by the embraces of the long fibrous plants that grow up and are interwoven with its layers: the *Kakivéru*, *Jihar chettu*, and the Ag bush (*Asclepias gigantea*), are those that most frequently occur. The hills of blown sand near Honoor present a gentle slope to windward, up which the particles of the sand are moved by the wind, and fall over on the leeward side at an angle of about 45°.

A precisely similar contour assumed by heaps of particles of sand acted upon by currents of air, on the small scale, has been noticed by Mr. Lyell, in describing the production of the ripple mark on the sands of Calais; and his explanation of the process by which these hills in miniature are obliterated, reproduced, and advance over the graves of their predecessors, will equally apply to the formation and advance of the sand hills of Honoor. "The mode of the advance," says he[1], "was by continual drifting of grains of sand up the slopes A B and C D, many of which grains, when they arrived at B D, fell over the scarps B C and D E, and were under shelter from the wind, so that they remained stationary, resting, according to their momentum, on different parts of the descent, and a few only rolling to the bottom. In this manner each ridge was distinctly seen to move slowly on as often as the force of the wind augmented. Occasionally part of a ridge, advancing more rapidly than the rest, overtook the ridge immediately before it and became confounded with it, thus causing those bifurcations and branches which are so common." In some cases fluviatile shells have been blown up and imbedded in the sand; ripple marks left by the wind on their surfaces, and the process of consolidation, is alone wanting to transform the sand of yesterday's accumulation into a fossiliferous ridge.



I have observed similar sand drifts to be frequent in the Libyan desert, whence impelled by the westerly winds, they are sure to advance on and threaten the fertile valley of the Nile; and where, as in India, they have overwhelmed many of the ruins of ancient Egypt. The phenomenon of *Jebel Nakús,* (described in a previous paper,) in the wilderness of Sinai, I found to proceed from a heap of fine sand drifted on the steep side of a ridge of sandstone hills, and covering it from base to summit.

Those singular local whirlwinds, called *pisáchas,* or Devils, by the natives, whirl up sand in their eddies to an enormous height, and transport it across hills, rivers, and sheets of water of considerable magnitude. They are often strong enough to carry up pebbles, and land, marine, and freshwater shells, which are thus occasionally deposited in situations above the drainage level of the country, at a distance from their native beds, 'and in situations where it would be otherwise difficult to account for their presence, except by the agency of the aquatic and other birds that prey on the tenants of shells.

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[1] Lyell's Elements, Vol. I., p. 43.

[*To be continued*].

ART. XII.—*The Chenchwars; a wild Tribe, inhabiting the Forests of the Eastern Ghauts.* *By* CAPTAIN NEWBOLD, F.R.S., &c., *Assistant Commissioner for Kurnool.*

[*Read June* 15, 1844.]

SINCE the year 1836 I have occasionally come in contact with a singular half-savage race of aborigines in Southern India, and have lately sent them a few questions, which, with their answers, I have the pleasure to forward to the Society. The information, though scanty, is full of interest, as relating to the remnants of one of the many races that inhabited India prior to the Brahmanical invasion, by which it is more than probable they were compelled to flee to the rocks and caves for shelter, stigmatised in Hindu annals as demons and rakshasas.

They are known to the neighbouring villagers by the name of *Chenchucoolam*, *Chenchwars*, and *Chensuars*. The tract where they have fallen under my observation, lies in the jungles covering the westernmost range of the Eastern Ghaut line, extending north and south between the Pennaur and the Kistna, and known locally by the name of the Nalla and Lanca Malla. They are doubtless to be found north and south of these limits; and, if I mistake not, there are a few aborigines resembling the Chenchwars inhabiting the hilly and jungly country north of Madras.

The aborigines of the Nalla Mallas are most frequently seen by travellers in the vicinity of the wild and difficult passes that cross the chain from the Cummum and Budwail valleys to the table lands of Kurnool and the Ceded Districts, where a few of them are employed as a hill police. The number inhabiting the tract I have described may be about 1200, but this is a mere approximation.

They inhabit clearings in the retired parts of the forest, one of which I unexpectedly entered while on a shooting excursion near Pacherloo, in the Nundi Cunnama pass. Their village consisted of bee-hive-shaped huts, huddled together in a cleared spot, cleanly swept and surrounded by jungle. The huts had walls of wicker-work, about three feet high, and conical roofs of straw, with a sort of screen thrown in front of the low entrance. The men, nearly in a state of nudity, were lying outside, here and there, fast asleep in the sun, tired probably with watching or hunting wild beasts during the night, while the women, rather more decently clad, were preparing their food, or nursing their children near the doors of their huts. The whole resembled a Hottentot kraal more than anything else. A number of large dogs instantly attacked the intruder, but were kept at bay with the butt of my gun until their somnolent masters were on the alert, and came to the rescue.

Features.—The women dress much in the style of the wandering female basket-makers, and resemble them in feature more than the Telugu Hindus, their neighbours. The features of the men are small and animated; the cheek-bones higher, and more prominent than those of the generality of Hindus; the nose flatter, and the nostrils more expanded. Their eyes are black and piercing; in stature they are usually lower than their neighbours. Their hair, which they wear very long, and rolled up at the back, or near the crown of the head, like that of a woman, is not the frizzly hair of the Papuan or the Hottentot, but is more shaggy and less straight, probably from exposure, than that of the Hindu; in person they are usually slightly but well formed, except about the knee, which is large, and the leg; the colour of the skin is slightly darker, and the disposition to cutaneous eruptions greater. Altogether they resemble what might be the produce of a cross between the Jacoon aborigine of the Malay Peninsula and a common Telugu Ryot of the neighbouring villages, more than any class of the human race that I can imagine or have seen.

Language.—They converse in Telugu, and affirm that they have no peculiar language of their own, but their pronunciation of it is harsh and peculiar; in intonation of voice and animated gesture, they often reminded me of the Malayan Jacoons. They have no written character, nor could I find a single individual who could read or write.

History.—They have no written inscriptions, either on stone, copper, or palmyra leaf; and no tradition of their origin, farther than that they have always understood that their ancestors have inhabited these jungles and mountains ever since the mountains were created, and that they never emigrated from any other country. The Brahmans, however, with that love of appropriation that distinguishes them, have presented me with the following legend of the origin of the Chenchwars.

Previous to the incarnation of Sri Krishna Swami, in the Dwapara Yug, (the third of the four great ages,) the Chenchwars were shepherds of the Yerra Golla caste; Obal-Iswara, the Nrisimha swami of Obalam, (a celebrated hill-shrine in the Nalla Mallas,) having taken away and kept, as a Chenchita, a maid of the Yerra Golla family, begat upon her children, of whom they are the descendants, and are consequently styled Chenchwars.

Religion.—They appear to have little or no idea of religion beyond what they have picked up from the surrounding Hindus. The testimony of the Atkoor Chenchwars, as will be seen, savours strongly of Brahmanical interpolation, and embraces the leading doctrine of the metempsychosis, while the Nundial Chenchwars assert their perfect ignorance of a God or soul, and I know they are not in the habit of worshipping images, beyond attempts to propitiate some of the Hindu saktis through fear, a custom which has even extended to Mussulmans. The questions touching their religion have been imperfectly put and imperfectly answered. Better information on this head is required before any theory is built upon it.

Customs.—The distinctions of caste, the crimes of infanticide, sati, human sacrifice, and cannibalism, are unknown. They (such as can afford it) practise polygamy. Their marriage consists in a simple agreement before the assembled relatives and elders of the tribe. The Atkoorians state that they *burn* their dead usually; but *bury* whenever it is desired by the nearest relatives of the deceased. The Nundialites affirm that they always bury, and it appears to be the custom, as among some of the Tartar tribes, to carry the weapons of the deceased to the grave; but whether they are buried with the corpse or not, I have not yet been able to ascertain.

Communities and Laws.—They are divided into little tribes, or clans: in each clan there are certain heads, or elders, who decide disputes, and punish malefactors; murder is atoned for by death. Passing through the jungle near Pacherloo, I observed a skull, bleached by the sun, dangling from the branch of a tamârind tree, which I was informed was that of a murderer and hill robber, put to death by these sylvan judges, whose simple code seems to be founded upon the same principle as the *Lex talionis.*

Dress and Weapons.—Some of the better classes wear a cloth round their waist, short pantaloons reaching to the knees, and a handkerchief round their head, like the Hindu Kunbi; but the generality content themselves with a dirty rag to cover their nudity. The elders are distinguished usually by being armed with a spear, a hatchet, or a matchlock, while their less fortunate brethren are obliged to content themselves with a rude bamboo bow and arrow of reeds, tipped with iron. A flint and steel, and a small supply of tobacco, of which they are extremely fond, completes the Chenchwar forester's equipment. They are not remarkably expert as archers, if I may judge from the awkwardness they exhibited in dispatching an unfortunate sheep I had picketed for them at forty yards, and which was held out to them as the reward of the best marksman.

I found them good beaters, patient and docile, with a remarkably fine eye for game in a jungle, in which they rival their brother Jacoons on the other side of the Bay of Bengal.

They keep very much to themselves and their wigwams in the jungle, are mightily proud, and, like the Highlanders of old, these *sans culotte* sons of liberty look upon weaving and the arts of civilization with the most profound contempt. They state the jungles and wilds they inhabit to be far more healthy to them than the plains; and, as a proof, aver that cholera has never penetrated to their *gudems*.

Question.—How many tribes of Chensuars are there in your vicinity, and what are the names of the tribes?

Answer of Atkoor Chensuars.—There are five tribes or *Gotrums*, viz: 1, Wuttalur; 2, Gauraboyina; 3, Jellevandu; 4, Gulla; 5, Chellawudru.

Answer of Nundial Chensuars.—There are thirty-one tribes, viz.: 1, Tota; 2, Avul; 3, Gulla; 4, Maudla; 5, Chigulla; 6, Uttaluri; 7, Jelli; 8, Chala; 9, Niniwala; 10, Gauraboyina; 11, Balli; 12, Guram; 13, Palmás; 14, Indlé; 15, Arity; 16, Jenesh; 17, Barmula; 18, Kurtuola; 19, Pusatla; 20, Gujjalru; 21, Yelpula; 22, Sangu; 23, Dasari; 24, Ravur; 25, Pulem; 26, Pulcherla; 27, Raya; 28, Chala; 29, Jamana; 30, Mundla; 31, Tatté.

Q.—Who are the heads of the tribes, and what are their names and titles?

Atkoor.—Their names are, Kanwa, Wagadu, Buchadu, Lingadu, Korti, Kanama, Nagadu, Tuppadu. They have no titles, but generally carry a matchlock, spear, or a hatchet.

Nundial.—We do not know their names or titles.

Q.—What are the names, number, and situation of your villages?

Atkoor.—We live in Chensu huts in the Nalla Malla Mountains in the Atkoor Pass near Nagalutri, on the road to the Parvatta shrine in the Yelyute Pass, and in the jungles near Bandinempolliam, Kotapally, Indreshwaram, Pedda Chirru, and around the hill shrine of Parvatta.

Nundial.—We live near the Ratan trees on the hill of Padamala Kalwa near Omkarum, on the hill of Gazupilly, and on the hill of Narrainpuram, a hamlet near Ghali Chennapolliam.

Q.—Are these huts fixed and stationary, or are they removed from place to place like those of the Yerukalwárs and Lambadis?

Both.—They are not removed from place to place. From the time the Nalla Mallas were formed our ancestors have inhabited these mountains from father to son.

Q.—Does each village possess a "*Bárah Balluteh?*" (Hindu village system of twelve, consisting of blacksmith, carpenter, Punchungum, &c.)

Both.—There is no Barah Balluteh.

Q.—Have you any distinction of castes?

Atkoor.—We have no distinctions of caste; our chiefs are only distinguished by the spear, hatchet, or matchlock.

Q.—Have you any fixed laws?

Both.—No.

Q.—What do you do in cases of murder, theft, &c.?

Atkoor.—Whenever a murder is committed all the heads assemble together and kill the murderer in return. In case of robbery, if the stolen property be discovered, or the party voluntarily restore, nothing further is done. If the thief do not restore the property, and confesses his crime, we collect from him an equivalent; and, in case he does not possess any property nothing further is done; since what has been expended cannot be recovered. Capital punishment is executed in the same manner and with the same weapon, as the crime for which it is awarded. All petty offences, such as assaults, striking one another, are punished by the heads, by beating the offender in return, and by reprimand.

Nundial.—In cases of murder the perpetrators are put to death in return. Thefts and assaults are punished as above.

Q.—How are civil cases disposed of?

Both.—By the heads, who assemble without regard to number, which depends on the number present in the village; and after examining witnesses and the parties, decide the question. They assemble near the *gudem* or huts.

Q.—Do Sati and infanticide ever take place among you, or human sacrifice?

Both.—Never.

Q.—Is polygamy allowed?

Both.—It is.

Q.—What are the usual ceremonies and customs at marriages?

Atkoor.—Beating tomtoms, distributing betel, fruits, &c., presenting the bride with a new *réku* (a sort of cloth like the Hindu sarhi), and a coarse *choli* or vest. The bridegroom gets a new handkerchief to tie round his head, and a *chadr*, a cloth like a shirt. The people of the tribe are all invited. We have no other ceremonies than these. A dance takes place.

Nundial.—Tomtoms are beat, and a dance takes place.

Q.—What are the usual ceremonies at deaths? and do you bury or burn your dead?

Atkoor.—When a person dies he is lamented over by his relatives for a while: the corpse is then washed with water, laid on a bier made of the stems of the bamboo, and borne with the weapons the deceased used in his life-time,—matchlock, spear,—to the funeral pile, and burned. The relatives mourn two days, and afterwards invite the people of the tribe to a feast, with which the mourning terminates.

Nundial.—Same as above, but they state they *bury* their dead.

Q.—What are the ceremonies at births?

Both.—As soon as the child is born, the umbilical cord is cut, and the child is washed. On the third day the ceremony of purification is performed, by inviting all the *women* of the tribe to a feast, and presenting them with betel leaf. On the fourth an old woman gives a name to the child, which it retains ever after.

Q.—Do you ever eat human flesh, or the raw flesh of animals?

Both.—We do not.

Q.—What species of food is forbidden?

Both.—We do not eat of the flesh of bullocks, buffalos, crows, kites, vultures, storks, &c. The flesh also of tigers, camels, horses, swine, and monkeys is forbidden, but we eat other animals, and drink the fermented juice of the palm.

Q.—Does slavery exist among you?

Both.—No.

Q.—Have you any written annals, inscriptions on stone, wood, or copper, or traditions of the origin of your race, whence it came into these jungles and hills?

Both.—Our ancestors have always inhabited these jungles and mountains from time immemorial. We have no history, nor inscriptions, nor any tradition of ever having come from any other country into this.

Q.—Why do you inhabit unhealthy forests and mountains? Why do you not live in the open plains, tilling the earth, digging wells, weaving cloths, or trading like civilized beings?

Atkoor.—Dwelling in hilly jungly tracts has ever been thought healthy by us and our ancestors. There the smell of other men does not reach us. In the plains the sight of other men excites fear, which engenders diseases. With regard to well digging, weaving, &c., we are not capable of these tasks.

Nundial.—As we have been always accustomed to the jungle, we inhabit it, because residing in open plains will cause diseases. We are loath to follow the arts of cultivation, weaving, &c., as they are prohibited, and whoever practises them is expelled from the tribe.

Q.—Do you ever intermarry with the Telugus or other inhabitants of the plain, or with any other people?

Both.—We never intermarry with other people.

Q.—What is your usual mode of life?

Atkoor.—We barter honey, wax, Ippa flowers, Karakkáya tamarinds, and other jungle produce, with the inhabitants of the plains for cloths, grain, tobacco, &c.

Nundial.—We sell honey and bees' wax, and hunt wild animals.

Q.—Describe the mode of hunting, and show specimens of the snares and traps you use.

Atkoor.—We have no snares, &c., but hunt with bows, arrows, and matchlocks.

Nundial.—We do not use snares or traps. We shoot bears; but do not kill elephants or tigers.

Q.—Do you employ poison to tip the ends of your arrows? If so, send some of the poison, and a list of the herbs and minerals of which it may happen to be composed, and describe the mode of concocting it.

Atkoor.—No poison is employed. We sharpen our weapons on a stone, with a mixture of water and salt.

Nundial.—We do not use poison.

Q.—What is your usual food?

Atkoor.—The cooked flesh of the animals we kill, the grain we get in barter; and should these fail, we live upon Kúnda roots, &c.

Nundial.—We subsist on honey, Chensu roots, wild herbs, and rice.

Q.—Are there any doctors or wise men among you; and what are your medicines?

Atkoor.—There are some respectable persons among us, who make decoctions of the leaves and roots of trees, and give them to the sick.

Nundial.—We have no doctors. The medicines used by the Hindus are used by us. We do not know of what they are compounded.

Q.—Have you any other intercourse besides that of barter with the Hindus of the plains?

Both.—None.

Q.—Have you any priests or pujaris?

Both.—None.

Q.—Do you believe in the existence of a God and a soul?

Atkoor.—Yes.

Nundial.—Cannot say. No one has instructed us in these matters.

Q.—When a man dies, does the soul die also?

Atkoor.—No; the soul goes to God: others become evil spirits and will appear again.

Nundial.—We do not know.

Q.—Are men rewarded or punished after death according to their good or evil acts when living?

Atkoor.—Yes.

Nundial.—We do not know.

Q.—What punishment, and who is the inflictor?

Atkoor.—The attendants of the keeper of hell (Yama), punish the guilty by converting them into worms and tormenting them in various ways.

Nundial.—We cannot say.

Q.—What reward, and who is the granter?

Atkoor.—We have heard our elders say that the Supreme Being keeps them in the Holy Regions, where their desires are all attained.

Nundial.—Do not know.

Q.—What is the place of reward called?

Atkoor.—The heaven; the residence of the God Ramasami.

Nundial.—We do not know.

Q.—Are these punishments and rewards everlasting?

Atkoor.—They are not everlasting: when the punishment is at an end the guilty will be born in another state of being, according to his acts: even with regard to the rewarded, they are to remain in the adorned regions only for a limited time, and then to reappear on earth in another shape.

Nundial.—We do not know.

Q.—Are you ever converted to Mahomedanism or Hinduism?

Both.—Never.

Q.—What is your language?

Both.—It is like that of the Telugus, but differs in pronunciation.

Q.—Can any of you read or write?

Both.—No.

ART. XIII.—*Account of Aden; by* J. P. MALCOLMSON, ESQ., *Civil and Staff Surgeon.*

[*Read February* 15, 1845.]

So much has already been written on the topography of Aden by travellers who have visited the place, either from motives of curiosity, or on their way to more distant regions, also by individuals whose duties have detained them there, that I fear any information which I can add to what has already been made known, will be of little interest; however, in compliance with the request of a friend, I forward such remarks and observations as a permanent residence of six years has enabled me to collect.

It might be deemed quite superfluous in me to enlarge upon the importance of Aden as a valuable acquisition to the British possessions in the East, commanding as it does the high road of nations in the rapidly increasing intercourse between Europe and the East; or to recapitulate the superior advantages which a six years' occupancy as a coal dépôt and naval station has proved it to possess far above any other locality that could have been selected. I shall therefore confine myself to such observations as occur to me under the different heads into which I propose to divide the subject, premising a few remarks on the geological formation of the place.

GEOLOGICAL FORMATION.

The peninsula of Aden, of which Semilla, the most southern promontory, forms Cape Aden, is situated in 45° 9′ east long., and 12° 47′ north lat., is most unequivocally of igneous origin, and may be considered throughout one mass of volcanic and pseudo-volcanic rocks, differing but little in appearance and composition. The circumference of Aden may be laid down at about eighteen or twenty miles, the greater part being occupied by a range of high hills, extending from the north-west to the south-east. The line of ridge of these hills is exceedingly uneven, and peaked; the centre considerably higher than its two extremes, forming the high peak called Gibel Shumshum, which at its highest part attains an elevation of 1770 feet, and can be seen, in clear weather, when approached by sea from the eastward, at a distance of sixty miles. On the south and south-western sides the black basaltic hills rise abruptly from the sea to a considerable height of many hundred feet; it is also exposed to a heavy surf during the south-west and north-east monsoon, which makes landing in boats on that side impracticable. From these precipitous terminations to the Southern Pass a number of spurs extend down to the sea, where they all end bluff and abruptly, encompassing white sandy bays; indeed, Aden, as shewn on the map, may not inaptly be compared, in figure, to the shell called the Knotty Plerocera.

The town of Aden is situated in a valley, which is evidently the crater of an immense extinct submarine volcano, and which, in its active though submergent state, has thrown out immense torrents of lava in every direction, to an extent which far exceeds any idea that we can form from the operations of volcanoes of the present era; after a season of repose, of perhaps tens of thousands of years, it appears to have become again active, and a second crater to have opened on the north-western side of what is now the valley of Aden, forming what is designated in the plans the table-land, or eastern buttress of Shumshum, shattering in its operation the ancient crater nearly through its centre, from the Northern to the Southern Pass, breaking into pieces and separating the whole of the eastern side of the edge, one fragment of which formed the Island of Seera, another Durab-el-host, and thus forming an opening through which the lava escaped into what is now known as Eastern Bay. The remains of the second eruption (worthy the observation of the geologist) are still visible on the table-land before alluded to, and, geologically speaking, do not bear signs of any very great antiquity; however, I wish it to be distinctly understood, that these important events occurred long anterior to the time in which animal life was called into existence, and probably occupied a million of years in their operation.

The whole ridge of hills before mentioned are composed of lava in its various forms, from the compact basalt (ponderous, and containing a very large proportion of iron) to the pumice stone which floats on water; a great variety of minerals, in very minute crystals, are found imbedded in the lavas, amongst which I may mention some beautiful specimens of obsidian, curiously grouped quartz crystals radiating from a common centre; some very pretty specimens of specular iron ore are also met with. Trachyte is found in immense masses, contorted into various singular and fantastic forms. It is very singular, that nearly all the rocks in Aden have such an excess of alkali in their composition as to render them totally unfit for the external facing of permanent works. These rocks, when exposed to atmospheric influence for even a brief period, peel off in exceedingly thin laminæ, under which is found a saline efflorescence. This quality in the stone I considered of such importance, that I communicated my remarks to the Military Board; in consequence, instructions were given to the engineers superintending the construction of the public works, to reject all such as appeared to be possessed of this disintegrating quality. There is only one part which I have yet discovered in the whole range of hills that affords stone of sufficient dimensions, and capable of resisting exposure to the air. This is a peak projecting from the northern side of the table-land, composed of exceedingly hard and slightly vesicular basalt, which is principally a mixture of iron and silex, chemically combined with crystals of felspar, and small garnets interspersed. The stone from this peak requires to be blasted, the effects of which, the hill being precipitous, project the stone into the valley, where it is cut and dressed as required; from thence, a good road having been constructed, it is conveyed in carts to the different works: of this stone the works at the main or northern gate are constructed, and for durability it is equal to any ever used. It certainly appears that the whole of the rocky masses of Aden are traversed and intersected by dykes, which deserve remark as exceedingly curious phenomena; they are almost in every instance perfectly vertical, standing out in many places in bold relief from the dark, frowning, black lava. In one place they are observed to take a tortuous, or zigzag course, running mostly in a north-east and south-west direction, some trachytic and others basaltic; others again run in a direct line across the whole peninsula, till they are lost in East and West Bay; some of them assume a mixed or porphyritic composition. These dykes are in many places separated from the rock, on either side, by layers of coal-black coloured rock, very brittle, and easily crumbled in small pieces, nearly approaching pitch-stone in its composition and qualities. The dykes have evidently been injected from below at the time the rocks were shattered by the second series of volcanoes. On the north-western aspect, or that in Back Bay, the rocks are chiefly composed of tufaceous strata, alternating with an immense number of lava currents, varying from two to ten, or even twenty feet in thickness. There are also layers, if I may so call them, of scoriæ, fragments of basalt and other igneous rocks, cemented firmly together by quartzose sand, and oxide of iron.

To the north-west, Aden is attached to the main land by a low sandy isthmus, the greatest elevation of which above the level of the sea does not exceed six feet, and its breadth not more than three-quarters of a mile. This isthmus separates Eastern from Western Bay, and gradually enlarges in breadth till it reaches Khora Mucksa, a distance of three miles, where the British possessions in Arabia terminate: a large morass is here formed by the sea, but fortunately unproductive of vegetation; across this isthmus, within musket-shot from the base of the rocks, on the right and left flanks, are the field works, the chief defence of Aden, built on the ruins of what is called the Turkish Wall.

It can hardly, in my opinion, admit of a doubt, that Aden was an island at no very remote period; and that the isthmus has been formed by the tides from East and West Bay meeting on what was then probably a ledge of rocks, their current becoming thus neutralised; nearly the whole of the isthmus is composed of comminuted shells;—indeed the whole of the low sandy belt, which lies between the sea and the high hills, distant about forty miles, has been undoubtedly formed in a manner somewhat similar, assisted materially by the debris carried from the mountains by the torrents: these changes were not effected in a few years, or even centuries, but must have required thousands of years in their accomplishment; this may also have been assisted by the elevating power of subterranean heat.

It is a well ascertained fact, that whole tracts of country have been thus elevated, and that other portions have been depressed. The space of ground in rear of the Turkish Wall, extending to the base of the hills, which is a perfect flat of considerable extent, and somewhat lower than that in front, is likewise composed of comminuted shells, sand, and the debris carried from the hills, mixed in some places with clay, formed by the decomposition of the rocks; in the rear, this valley or plain is surrounded and commanded by precipitous rocks, extremely difficult of access. The part which is just below the hills, has been considerably lowered; principally by the inhabitants of Aden having carried off the soil for building purposes in the town; this they continue to do even at the present time. The whole of this plain is deeply impregnated with salt; in the dry weather the surface is covered with a saline efflorescence, which crisps under the feet when walking over it; at night it attracts atmospheric moisture and deliquesces; capillary attraction also assists in adding to the moisture of the place. In every part of the plain which has been tried, salt water has been found five feet below the surface. The military commission appointed to report on the fortifications, have recommended this plain as being well adapted for the site of the military camp. I consider it totally unfit for the purpose, and in a medical point of view, the worst place that could have been selected; and do give it as my firm belief, that the measure would be fraught with imminent risk to the health of the troops who should be stationed there.

Fauna.—The animals indigenous to Aden are very limited indeed and merely include a few monkeys, which Arab tradition says are the remains of the tribe of Ad, who were changed into monkeys as a punishment for their excessive wickedness: these monkeys are very timid, never visit the town, and are but seldom seen on the hills. A few hyenas of a small size are occasionally seen in the ravines; a very beautiful kind of fox exists in great numbers, and these descending from the rocks at night are exceedingly destructive amongst the poultry. The whole place swarms with rats; snakes, lizards, and scorpions are the only reptiles found; the former are not venomous, the lizards are very timid and harmless. There are two kinds of scorpions; one grows to a large size; some which I have caught have measured eight inches in length, of a dirty dark yellow colour, with a black tip to their tail; the sting from this kind, though productive of much pain and tumefaction of the injured part, is not attended with any danger; a dose of ammonia and laudanum almost instantly obviates all inconvenience, the swelling soon afterwards subsiding by friction with a little oil. The other species is very small and black; it is seldom found in houses, its usual habitation being in the hills, under stones and in the crevices of rocks, from which it is difficult to distinguish it; the natives dread this kind, and say that its sting is almost in every instance fatal; this I disbelieve, though, at the same time, I must acknowledge, that no case of a sting from this creature has ever come under my observation. As the ruins become cleared away, vermin will, as a matter of course, greatly disappear.

Flora.—The flora of the hills is more extensive and interesting to the botanist, and in the higher clefts of the rocks some pretty delicate flowers are to be found during the cold season. A few trees of stunted growth were to be seen in the ravines and valleys when the English first occupied Aden, and in some places the acacia had attained a considerable size; these, I am sorry to say, have now entirely disappeared, in consequence of the camp followers and townspeople having cut them down for firewood, when the supply from the interior was stopped. This is much to be regretted, as after a fall of rain the trees and shrubs assumed a pretty appearance, and contrasted pleasingly with the dark masses of lava and basaltic rocks.

Climate.—The climate of Aden may be divided with propriety into two seasons—the hot and cold, or north-east and south-west monsoons. The former commences at the end of April and continues till the beginning of October; during these five months the south-west wind continues to blow almost uninterruptedly with great violence, commencing daily about 8 A.M., and generally subsiding at sunset; not unfrequently, however, it continues during the whole night. About 8 P.M. a gentle sea breeze sets into Eastern Bay from the north-east, which, sweeping in its course over a great expanse of sea, reaches the heated rocks of Aden with a coolness and invigorating freshness truly delightful after the exhausting heat of the day; this breeze continues till near sunrise, when a calm succeeds, the wind in the interval veering round to the south-west. Hot nights, such as are experienced in India, are of rare occurrence in Aden; during the prevalence of the south-west monsoon, the hot winds, which rush down the hills with exceeding great fury, carry in their course clouds of dust that penetrate into every part of the house, and even into boxes and drawers; the thermometer frequently ranging as high as 104° in the shade. This great increase of temperature is not, however, productive of any increase of sickness; on the contrary, the number of sick is decidedly less than in the cold season. During the north-east monsoon the wind frequently blows very strong from that quarter, particularly at the full and change of the moon, sharp, and loaded with moisture, producing catarrh and dysentery amongst the European troops, rheumatism and slight fevers of a few days' continuance amongst the native part of the garrison: the former very obstinate, the latter of but little account and easily removed. Polished metals exposed speedily rust, and dyed cloth fades remarkably soon, evidently from the saline particles contained in the atmosphere; many of the rocks also shew a moisture on their surface, from the excess of alkali which they contain deliquescing. It has often been observed by medical men, that during the prevalence of certain winds, wounds and ulcers assume a foul, sloughy, and unhealthy aspect: this has been fully exemplified at Aden, during the continuance of the north-east monsoon, when wounds, however healthy in appearance, soon degenerate; even the slightest abrasions of the skin almost invariably occasion exceedingly troublesome sores of a very unmanageable character, and in former years often terminated fatally.

Rain occasionally falls with tropical violence in the months of November, January, and February. These electric showers generally pass from the north to the south, accompanied by loud thunder and most vivid lightning, and have a very sensible effect in cooling the air. The mornings and evenings at these times are truly delightful; apart from this the rains are not productive of any other good effect, as from the inequality of the surface, occasioned by heaps of ruins, it merely washes the filth of the place into the hollows, and a most disagreeable effluvia is the consequence. Time will remedy this; even now the ruins are fast disappearing as they become requisite for building purposes. Periodical rains, such as fall in India, would soon make Aden uninhabitable, as malaria of a destructive kind would be the result. There are but few cloudy days in the year, consequently the glare reflected from the bare heated rocks is excessively distressing to the eyes; ophthalmia is, however, of rare occurrence; the exemption from this painful complaint, under circumstances so favourable for its production, is not easily to be accounted for. The thermometer in the cold months, from October till March, falls as low as 64° at night, and at mid-day only rises to 86°.

There is one peculiarity regarding the heat at Aden which ought not to be passed over without remark: that is, the difference that at all times exists between the sensible heat and that indicated by the thermometer; this is striking in a very perceptible degree to every person who has paid attention to thermometrical observations. The dews are heavy, and the fogs, totally devoid of moisture, are frequen in the evenings during the hot season, covering the tops of the hills; the dews seem to be productive of no ill consequences to those who sleep exposed to their influence, which many of the natives do, merely following the old native custom of covering the head with a cloth. I am of opinion, that the gusts of wind which rush down from Shumshum with such an overpowering force, are intimately connected with electricity, and may be denominated electric winds: this point I have not yet satisfactorily investigated.

The climate of Aden, for seven months in the year, may be considered equal, if not superior, to that of most stations in India.

INDUSTRY.

Agriculture, or rather I should say, horticulture, has as yet made but little progress; from what has been already produced in the experimental gardens sanctioned by Government three years ago, the fact is established beyond a question of doubt, that the soil is capable of supporting vegetation, and that all the valleys would be highly productive if irrigated; but the expense of procuring water in sufficient quantity, will always be a serious impediment to horticultural pursuits. Vines, could an adequate supply of water be procured, would grow luxuriantly, as decomposed volcanic rock is the soil in which they thrive best. The manufactures of Aden do not require notice, as such can hardly be said to exist. A coarse cotton cloth was at one time manufactured; but as the proceeds did not produce an adequate return to the labourers, from their being unable to compete with the cheap cloth of a similar description imported from Bombay, the weavers have betaken themselves to other employments. The government and other works have created a great demand for manual labour. The description of artisans usually found in Indian villages are to be found in Aden; I cannot say that they are very expert in their respective lines of business; some few silversmiths practise their trade in making native ornaments; but their art cannot boast of much elegance.

Roads.—Some good roads have been constructed by the engineer; one in particular extends from the centre of the military camp to the fort built at Steamer Point on Ras Marbat; another not less worthy of notice commences at the foot of the hills inside the town, and extends along the top of the northern range, terminating at the main Pass. This has been a work of great labour, but of singular utility, as it enables guns, and other munitions of defence, to be taken up and moved with facility as required. The conveyances for hire, apart from the military, are camels, horses, mules, and asses, which may be obtained at a regulated and moderate sum.

Population.—There are few places where population has so rapidly increased since its occupation as Aden. In January, 1839, when the British took possession of the place, the inhabitants certainly did not exceed one thousand poor squalid half-naked creatures, whose chief food consisted of dates and fish; since then the influx of settlers has been rapid and is still increasing; some are attracted by the increased circulation of money occasioned by the troops, and by government expenditure for general purposes; the increased trade has also attracted many men of property from Mocha, Jidda, and other parts in the Red Sea, and elsewhere. Numbers of these people have built commodious houses, and many more would follow their example, but for an impression which the most respectable merchants still entertain, that the British do not intend to hold permanent possession of the place; this they say is to them evident, as during a five years' occupation Government has not erected any buildings which would indicate their determination to keep possession, as they would have done had a permanent settlement been contemplated. This circumstance certainly gives them reason to think that the investment of money in building is precarious and unsafe, and has retarded the improvement of Aden very greatly. Building materials have been accumulated by the inhabitants to a considerable extent and at great expense, and all they require is a guarantee, that we do not intend to abandon the place. The aggregate population (Troops and Navy not included) may be taken at 20,000;

this is certainly not above, but perhaps greatly under the number, as many of the Mahomedans are unwilling to acknowledge the number of females in their houses. Europeans, male 5, females 2; Portuguese, male 136, females 20; Arabs, male 12,000, females 4300; Soomallees, male, 1600, females 700; Jews, male 700, females 600; Banians, male 220, females none; Parsees, male 50, females none; Indian shopkeepers 150; Borahs 130; Affghans 190; African Seedees, males 180; Egyptians, male 146, females 51: total, males and females 20,000. Troops and camp followers of the Force 3484, of whom 850 are Europeans. Here is one of the many instances in which the moral influence of a few Europeans can control and direct the energies of the many. In addition to the above, the fluctuating population may be taken at 1500. Total inhabitants of Aden will therefore be upwards of 24,984.

Dwellings.—In no part of the world are the dwellings generally speaking built of more fragile materials than those of Aden. They are built, or rather constructed of wooden uprights, the intervals filled up with a kind of reed found in the interior, and are covered internally with matting formed from the leaves of the date-tree; the roofs are inclined like the slate roofs in Europe, and covered with a species of sedge, which, if well put on, is impenetrable to the rain. Upon the whole, I may safely assert, that these houses, in a place where rain seldom falls, are better adapted to the climate than stone edifices of more costly construction. The great risk of destruction by fire and the perishable nature of the materials, are the great, and perhaps only objections to this kind of quarters; an instance of the danger and insecurity of being in houses thus constructed, was exemplified by the whole of the lines of the 10th Regiment Native Infantry, with the officers' quarters, having been totally destroyed by fire in less than two hours; and had not the wind at the time been fortunately seawards, the whole camp must have shared the same fate. These dwellings from the nature of the materials do not, as stone walls, absorb the heat during the day; consequently when the sun goes down, they have no accumulated heat to give out, and are thus cool at night.

Food.—The food and clothing of the inhabitants have improved greatly since they have become British subjects; almost every person, even the poorest, can now afford meat and rice, with such condiments as they wish to use. The importation of cheap Indian cloth and English piece goods has enabled them to go comfortably and decently clad, in which respect they were formerly eminently deficient. The

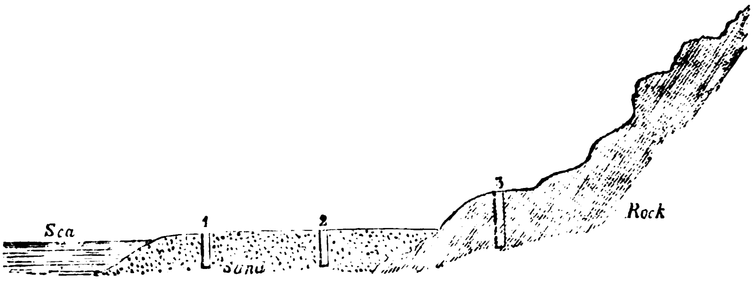
Soomallee tribes in particular could boast of nothing better than dressed skins; now such primitive clothing is scarcely ever seen.

Police.—The executive police of Aden, though not so good as could be wished, is yet remarkably well conducted, when the limited means placed at the disposal of the civil authorities is taken into consideration; in the first place there are no sewers, and there is the radical deficiency of a want of water to cleanse the town; and secondly, the Government do not allow an adequate scavanage to keep the place in a state of cleanliness. The streets are neither paved nor lighted; they are, however, marked out with regularity of an uniform breadth, and as the houses are built they are levelled. Burials, I regret to say, are still continued in the town, a practice which, from the limited dimensions of the place and consequent value of ground, should be abandoned. All casualties, of whatever kind, occurring in the town, are, by order of the Political Agent, carefully looked after and reported. No regular quarantine laws are established, but all vessels arriving are visited by a health officer, and on departure are furnished with a bill of health. I have seen more instances of longevity among the natives of Aden than in any port of India, and I have visited most of the military stations in our western possessions. There is no disease which can be called peculiar to the place; the inhabitants may be said to enjoy almost unvaried good health.

Prisons.—The prison of Aden is a good temporary building surrounded by a rubble wall, well adapted for the purposes intended. The rooms and airing ground are of ample size. In this prison a number of convicts from Bombay, condemned to hard labour for life, are confined; they are employed on the roads and fortifications of the place; every attention to their comfort consistent with their safekeeping is shown them. A surgeon visits the prison daily; a daily report of the sick is sent to the Political Resident, and every recommendation of the Civil Surgeon as to change of diet or exemption from work on account of sickness is immediately complied with. Upon the whole the discipline inculcated towards those unfortunates is considerate and humane; they are supplied at stated intervals with such clothing as the season requires, and during labour no harsh usage is authorized or allowed. No contagious disease or any peculiar sickness has appeared among the prisoners since the convict prison was established; their labour is moderate, and Sunday is a day of rest. There are no female prisoners, nor are females admitted into the prison; their food is good and in sufficient quantity.

Water.—The water at Aden is of a very superior quality, and the wells that supply it are deserving of particular attention. They are upwards of three hundred and fifty, situated mostly, though not invariably, at the foot of the hills, cut through the solid rock, to an average depth of forty feet, not more in many instances than four feet in diameter, and built from the rock with a circular rubble wall. The water in these wells never rises above twenty feet, where it remains stationary during the hot and cold weather. Some of the best wells, from which water is continually drawn during the day, sink a few feet by the evening; in the morning the water has again attained its former height; this may be considered as applicable to all the wells. Some of those which are lower down the valley are brackish, contracted probably by the water flowing or filtering through soil containing saline ingredients. Strangers visiting Aden are generally sensible of a slight saline taste in even our best water, which sometimes acts as a slight aperient; this effect ceases after a brief period. The source from whence the wells are supplied, has been, and still is, an interesting subject of much speculation; some say that it is merely the rain which falls on the hills filtering through the crevices of the rock, as in other places; this argument however is not tenable, as the rain that falls on the hills is almost entirely carried off to the sea, and even after the heaviest fall that we have ever witnessed here, the wells have not been affected, in the slightest degree, thereby plainly showing that we must look elsewhere for an explanation. A second party again assert, that it is produced by exhalation supplied by subterranean heat; this is a far-fetched theory not requiring notice. My opinion is, and I believe the principle of Artesian wells will bear me out, that the wells are supplied by subterranean and submarine currents, which flow from the high hills in the interior, and that its channel of conveyance lies between two beds of lava, the wells of Aden perforating the upper bed; the height which the water attains in the wells being the same at its source in the high land. This is substantiated in my opinion in a most decided manner by the surface always resting at the same height, the surplus water escaping to the sea, which it enters either in a submarine sheet of water or spring, as at Barein and other places on the Arabian side of the Persian Gulf, where it is not unusual for divers to go down in four and a half fathom and bring up fresh water. This is an established and well-known fact to all who have visited that shore.

This view of the subject being premised, we may rest satisfied that the supply of water at Aden is inexhaustible, so long as rain falls in the interior and the wells are kept clean. The old tanks now in ruins were, I believe, built before the wells were sunk, since which time they have been allowed to fall to ruin, nor does there now exist the least necessity for their repair. There is no occasion to take any notice of the aqueduct which formerly conveyed the water from a village inland, distant about five miles, for the supply of the troops formerly stationed at the Turkish Wall, and also for the supply of the shipping, as it appears to have been constructed about the same time as the reservoirs, and is also useless. It is a subject of importance and one on which great difference of opinion exists, whether water is to be found by boring in Western Bay, where the steamers coal; some expense has already been incurred in the trial, and the question is as undecided as ever. I have examined the whole of the western side of Aden with great care, and studied the matter treated of with attention; I found the formation and strata nearly similar in every respect to those in the eastern side of the peninsula, and after having maturely considered the whole circumstances bearing on the subject, I am most decidedly of opinion, that water might be found by sinking a well, provided the following points were attended to: a suitable spot must first be selected, where the solid rock, which is intended to be the mouth of the well, is above high-water mark, this to be ascertained by levelling; I mention solid rock for this reason, that there is a deep collection of stones, sand, &c., at the foot of most of the hills, through which, if the mouth of the well is not protected by the solid rock, the salt-water would percolate and frustrate the design. I conceive this to have been the cause of all the failures hitherto. The following rough diagram will perhaps illustrate my meaning in some degree:—



Now, suppose a well, No. 1, to be sunk through sand and stones, the sea-water will filter into it the instant the level of the sea is reached; go a little higher up the valley, No. 2, exactly the same obstacle will present itself; but commence at No. 3 in the solid strata, and the sea-water cannot penetrate there to impede the work or adulterate the water. The rocks are I fear too hard to be perforated by borers not accustomed to their work, and must be blasted; the commencement of the well must be made of suitable wideness; these premises being attended to, water will be found; the importance of which I need not enlarge upon.

General Remarks.

Aden as a naval and military station will, at no remote period, be one of the most important posts belonging to the British, appearances now indicating that there is every chance of part, at least, of the Indian trade being restored to its ancient channel. A six years' experience of the climate in medical charge of European and Native Troops fully warrants me in stating, without a fear of contradiction, that a more healthy station does not exist in any of the British colonies.

It cannot be denied that when our troops first landed in the place they suffered much from scurvy and ulcers; but in that year, 1839, scurvy visited nearly all our stations in India, in some instances accompanied by ulcers, which if they did not show the same inveteracy as at Aden, were very tedious in healing. During the first year's residence in Aden, the troops and followers experienced many privations, and owing to the almost continued state of alarm from expected attacks by the Arabs, the men underwent great fatigue, which all bore without a murmur. Added to this they were under canvas the whole time, living also on dry food, so unusual to the natives of India, whose food when in their own country is chiefly composed of vegetables. Fatigue parties were constantly in demand, for placing the guns in position on the heights and assisting in erecting temporary defences; from these causes wounds and bruises were of very frequent occurrence, which happening to men under a scorbutic diathesis degenerated into most inveterate ulcers, that for a long time resisted all medical treatment. Casualties were not unfrequent, particularly amongst the camp followers; the whole of the troops and followers were likewise obliged to sleep on the ground, occasioned by the want of cots; the town at that time was also in every part in a most filthy state; this must also have acted injuriously on the general health, and predisposed to disease. But now mark the difference, the beneficial change that a few years has effected; but few cases of scurvy exist, and inveterate ulcers have long since disappeared: this may be attributed to the troops being now in comfortable huts and having cots to sleep on, abundance of fresh vegetables, a well supplied bazaar, in which every article of their accustomed food is to be easily obtained; the men and their families are cheerful and happy, and appear contented; quarrels between the townspeople and the military scarcely ever occur. Numerous stone houses have been built, and many more are now in progress, in well levelled and regular streets; the revenue of the place is doubled yearly, which clearly shows an increased and increasing trade.

Art. XIV.—*Narrative of an Excursion from Peshâwer to Sháh-Báz Ghari;* by C. Masson, Esq.

[*Read January* 18, 1845.]

M. Court, of Mahárájá Ranjit Sing's service, in a Memoir on Taxila and Peucelaotis, a notice of which appeared in the Journal of the Asiatic Society in Bengal for August 1836, first communicated to the world the fact of the existence of a Bactro-Pali Inscription near Kapúr-dí-Giri in the vicinity of Peshâwer; of which, indeed, he gave a few letters copied by himself[1].

In the spring of the year 1838, Captain Burnes, being at Peshâwer, on return from his Kabul mission, sent an agent to Kapúr-dí-Giri to look after the inscription, who returned with a paper impression, which, if not perfect, made obvious the importance of having an impression or copy that was so. In September following Captain Burnes, who had gone to Simla, again instructed his agent to renew his efforts to procure a more perfect impression, which he did, but without effect. I was then at Peshâwer, which gave me an opportunity of turning my attention to the subject. I accordingly sent a trusty man with calico, paper, and other requisites for taking impressions, enjoining him to see and report upon the state of the people there, with reference to the practicability of my paying them a visit. To facilitate this ultimate object and the immediate purpose of his mission, I entrusted him with sundry small presents for the Maleks, and such of the people as might be particularly civil or serviceable to him. I had hitherto heard of a small five-lined inscription only, and although I sent six yards of fine calico, I had intended it to be expended in taking off as many impressions as the quantity would permit. My young man returned, having prosperously made his journey, and to my equal pleasure and surprise,

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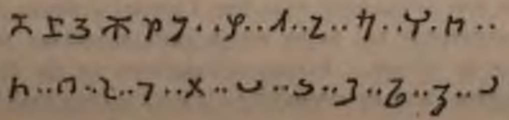
[1] "Quite close to this village (Kapúr-dí-Giri) I observed a rock on which there are inscriptions almost effaced by time, and out of which I could only decipher the following characters:—



presented me with the six yards of calico entirely covered with characters. It was manifest that the impressions had been very imperfectly taken, but I was ingenuously told by my agent that the task exceeded his ability, and required my own presence and superintendence; and that the impressions had been made at hazard in various spots to afford me an idea as to the extent of the Inscriptions. I now learned that they were of very considerable magnitude, which did not diminish my desire to be better acquainted with them. My young man reported favorably of the inhabitants, and brought me assurances from two or three of the Maleks, or petty chiefs, that they would be happy to see me.

In October, having decided on quitting Pesháwer, I considered that it first behoved me to do my best to take impressions and copies of these Inscriptions, and although we had tidings that Sirdár Saiad Mahomed Khan, the Dúrání chief of Hashtnagar, with his little army, was in the immediate vicinity of the place, and involved in hostilities with the people of the country, I would not allow prudential considerations to interfere with my purpose of ascertaining the nature of memorials, which could not fail to be of importance, from their being in the characters we find so prominent in the native legends of our Bactrian and Indo-Scythic coins.

Accordingly on the morning of the 16th of October, I left Peshá-wer, attended by a native of that place, who officiated as guide, and two of my servants, all mounted. We crossed the Dasht Sakka, an extensive plain to the north of Pesháwer, commemorated in Afghan history by the battle fought in 1808 between Shah Sújah-al-Mulk and the Shazada Kaisar, and thence passing the village of Mír Gúzar, crossed at Landi, by a ferry, the river Nagumán. From this we proceeded to the river of Kábul, of which the preceding is but a branch, and crossed it also by a ferry at the point where the Jind river effects its junction. At the village of Paráng placed on its northern bank we took up our quarters for the night. The castle of Hashtnagar, picturesquely seated on an eminence, was distant about a mile and a half to the north, and separated from us by the course of the Jind, which winds round its eastern front. We occupied a musjid, finely shaded by some noble plane trees, and received the civil attentions of Malek Azzád Khán, the principal of the village, and of his people. Our party also gained an accession in the person of a young lad of the village, who was acquainted with the Yúsufzai districts, and volunteered to accompany us; as he was a good pedestrian, we suffered him to do as he wished. Paráng is inhabited by the Mahomedzai tribe of Afghans, and by computation is distant from Peshámer seven cosses (ten miles and a half); the distance to Hotti, the first village in the Yúsufzai country, is reckoned twelve cosses (eighteen miles). The latter distance is entirely over an uninhabited plain, extremely dangerous to traverse, from the predatory incursions of the surrounding tribes, of whom the independent and lawless Baizai tribes dwelling at the skirts of the hills to the north are most notorious. These depredators come mounted and in numbers, armed chiefly with spears. Many were the efforts of our village friends to dissuade us from crossing the plain with so small a party; and abundant were the conjectures as to our probable fate, and as to the figure we might cut, if we should have an encounter with the Baizai adventurers; however we were not to be diverted from our purpose, and recommending ourselves to the good wishes of our friends, we retired to rest, anxious for the morning, and the adventures the day might bring with it.

17th October.—At sunrise we were on our march, and our animals, like ourselves apparently invigorated by the cool healthy breeze of the morning, proceeded at a rapid pace. Our young lad of the village with trowsers tucked up and his shoes under his arm, kept steadily in front, and verified the promise he had made to keep pace with our horses. As we passed along the plain, its surface sprinkled with tufts of grass and diminutive bair bushes, we observed to our right and left many circular mounds, and we found that similar objects are interspersed not only throughout its extent, but generally over the Yúsufzai country: they are invariably strewed with fragments of pottery, and many of them have a well, as all of them probably once had, attached to them. Their vicinities are alike covered with pottery fragments, and in our progress we passed two or three spots overspread with the same humble indications of human industry: in one instance, we fell in our path, upon a buried earthen jar; I descended from my horse, and with our knives we dug around it, until we were satisfied it was a funeral jar of the ancient inhabitants of the country. I note this incident because it serves, in my opinion, to explain the nature of these *tumuli*, and would lead us to infer that they are ancient places of interment, or that they are kilns where funereal jars and other articles of pottery were fabricated.

As we advanced on the plain, the quantity of grass increased, until at length it entirely covered the surface, so that our road became merely an alley between it. About mid-way, we had to our right hand, nearly a mile from the road, on a large tumulus or mound called Do-Sir (the double-headed), a tower, denoting the location of a collector on the part of the Hashtnagar chief, who collects transit fees on the merchandise passing from the Yúsufzai districts and the country west of Attok to Hashtnagar. At the eastern base of this mound were some fifteen or twenty huts. To our left, but distant four or five miles, alike conspicuously seated on a mound, was observed the inclosed village of Darghai, where also a collector of the Hashtnagar chief is stationed, who exacts transit fees on the merchandise passing between the Yúsufzai districts and Sohát. We were now entering what is esteemed the more dangerous part of the road, and had passed the limits of the jurisdiction of Hashtnagar. The grass was intensely thick, and attained the height of six or seven feet; we who were mounted could indeed look over it, and had around us the same unvaried view of one immense field of brown autumnal grass, extending to the base of the low black hills to the north, and to an undefined distance to the south, clouds having arisen over the Khattak hills which bound in that direction the great plain of Pesháwer; in front the same dull scene presented itself, but the Yúsufzai hills appeared in the distance, and among the grass we descried a large mound, which was apparently in our route. We soon neared the tumulus, and passing it immediately on our right, beheld peering above the waste of grass, a line of trees marking the boundary of the cultivated lands of the Yúsufzai, while the more prominent and lofty clusters pointed out the sites of Mirdán, Hotti, Túrú, Meyár, and other villages. We also distinctly beheld the low range of hills on which the inscribed rock is found, and the latter, my young man, who had visited it, would fain persuade me he recognised.

We soon reached Hotti, the first Yúsufzai village in this direction and inhabited by the Kamálzai tribe; we found it a large village of perhaps four hundred houses, and situated on the western bank of the Kála-páni rivulet (Black water), a small stream which after an inconsiderable course from the Baizai hills and defining the eastern limits of the Yúsufzais, falls into the Kábul river.

After some rest and refreshment we started for Sháh-Báz Ghari, the village nearest to the inscribed rock, which my young man had visited in his former trip. From Hotti its computed distance was four cosses (six miles). The road led through a thick grass jungle; half way we passed the village of Moab Banda, with about two hundred houses, and beyond it a copse of trees and ziárat, with an extensive old burial ground. We then gained the village of Ber Ghari of one hundred and fifty houses, placed on the western bank of the rivulet of Súdim or Sidim, and crossing the stream, which is inconsiderable as to magnitude, and flows like the Kála-páni in a sunken bed, entered on its eastern bank the village of Sháh-Báz Ghari, comprising about two hundred houses. These two neighbouring villages are inhabited by the Amánzai tribe; the river separating them, joins the Kála-páni below Túrú. Sháh-Báz Ghari is a name derived from a fakir or mendicant saint of dissolute notoriety who formerly dwelt at this place, and it is said corrupted the morals of the people of the country, by inducing them to imitate his licentious example. The more correct or ancient name of the village is said to be Ler Ghari, in contradistinction to that of its opposite neighbour Ber Ghari, Ler and Ber being Pashto terms for Lower and Upper, and equivalent to the Persian Bála and Payín. These distinctive terms are much in use in the Afghan countries with reference to contiguous villages of the same name, but which generally have some physical line of separation between them.

We arrived at Sháh-Báz Ghari in excellent time, having still two or three hours of day-light. We enquired for Malek Derú, who by my young man's account was the principal Malek, and who had before received him with civility; in answer to my enquiries, some said, he was not at home; others said, he was. I directed the horses to be picketed for the night, willing to let it be seen, that whether the Malek favoured me with his presence or not, I did not intend that the circumstance should affect my stay. This done, I called my young man, who had before seen the Malek, and told him to take in his hand a lunghi which I had brought as a present from Pesháwer, and by going to his house, to ascertain whether he was there or not. The young man went; and in a few minutes appeared, evidently in great joy, Malek Derú, a little old man, with sharp twinkling eyes, somewhat however dimmed by age. His discovery that I was the Faringhí (European) he had before heard of, with the conviction that I had come on no mission prejudicial to himself or to his village, gave him confidence and satisfaction, increased moreover by the acceptable present of the lunghi.

The Malek placed his son and nephew at the disposal of my people, to await their commands, and to assist them in procuring whatever might be needed; he was incessant in his attentions, and gave me much of his company. Towards night many of the other Maleks of the village assembled around us, and our conversation naturally enough turned upon the stone, or khán, as they called it. I found, that in the singular state of society which here existed, a Malek was appointed by every ten or twelve families, who had a voice in consultations on the affairs of the village; and that the most respected was decidedly my friend Malek Derú, both from seniority and wisdom, as well as affluence. I ascertained too, that he had influence beyond his village and tribe, and generally throughout the

Yúsufzai country. As to the stone, I was told that many attempts had been made to take impressions from it, for the Faringhís; and that only a day or two before, Badináth, a Hindú, had visited it on behalf of M. Court, and that the same man had taken away with him a marble slab with a Persian Inscription, from a Musjid at Kote. To my inquiries, as to whether they had any tradition respecting the stone and inscription, they answered, that they believed the latter to have been written by Sháh Báz Kalendar. The greatest good will prevailed, and although it was very late before the company broke up, we had arranged everything so as to commence our labours upon the stone in the morning, by procuring some implements in addition to those we had brought with us, and by engaging two or three of the villagers to assist us. My young man, on his former visit, had removed some of the moss which had grown over the greater part of the surface of the rock, and had discovered characters beneath it; to perfect this process and to develope the entire inscription was clearly our first course, and for it we prepared.

18th October.—Early in the morning we repaired to the stone, which was distant about one thousand yards from the village, and lying about mid-way up the ascent of a small ridge of hill, at the point where it subsides into the plain. [Plate I]. There is an idea that it has fallen from above; if so, it would account for the superior rock being intercepted by an inferior fragment at a point among the lower lines of the large inscription and thereby concealing a few of the characters. It is manifest this juxta-position and contact of the two rocks must have taken place since the inscription was engraved, or the characters affected by it could not have been inserted. A glance at the surface of the rock convinced me that my journey would be recompensed, and my people speedily set to work to remove the moss which obscured the principal inscription. [Plate II]. This was found on the northern face of the rock, and it was with much satisfaction I found the southern face had also its inscription. The surface of the rock did not appear to have been artificially formed or fashioned, but its tolerably smooth and even aspect was entirely owing to natural fracture. Many of the fragments of rock about the sides of the hill, and at its skirts, had fronts as well calculated to receive a graven record as the one which bore them, and they are all of the same rock, mineralogically considered, an arenaceous argillaceous compound. On looking direct at the inscription, it was evident that the upper lines were formed of characters a little larger and more carelessly fashioned than those of the lower lines; the lines were also more apart from each other than the

Plate I

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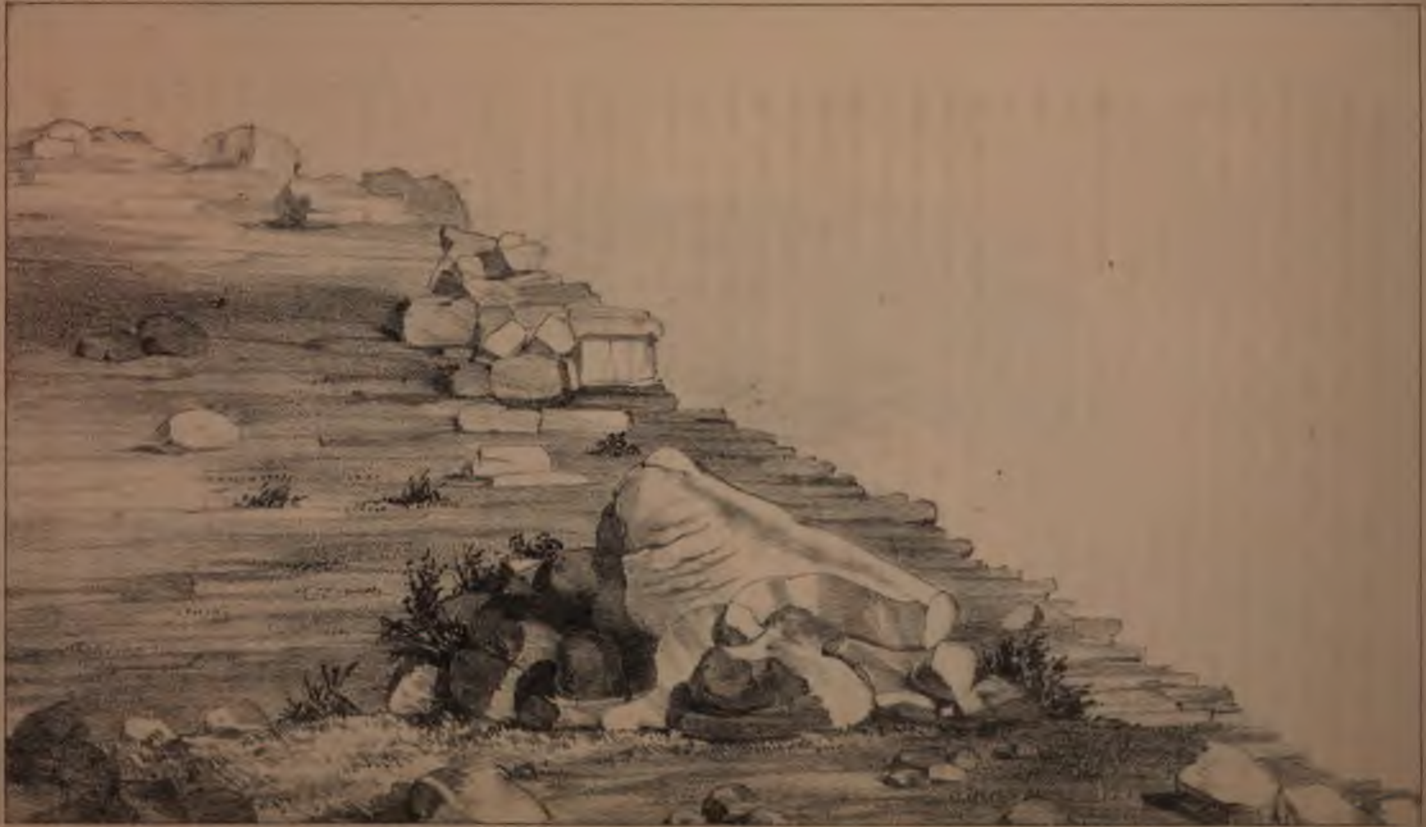
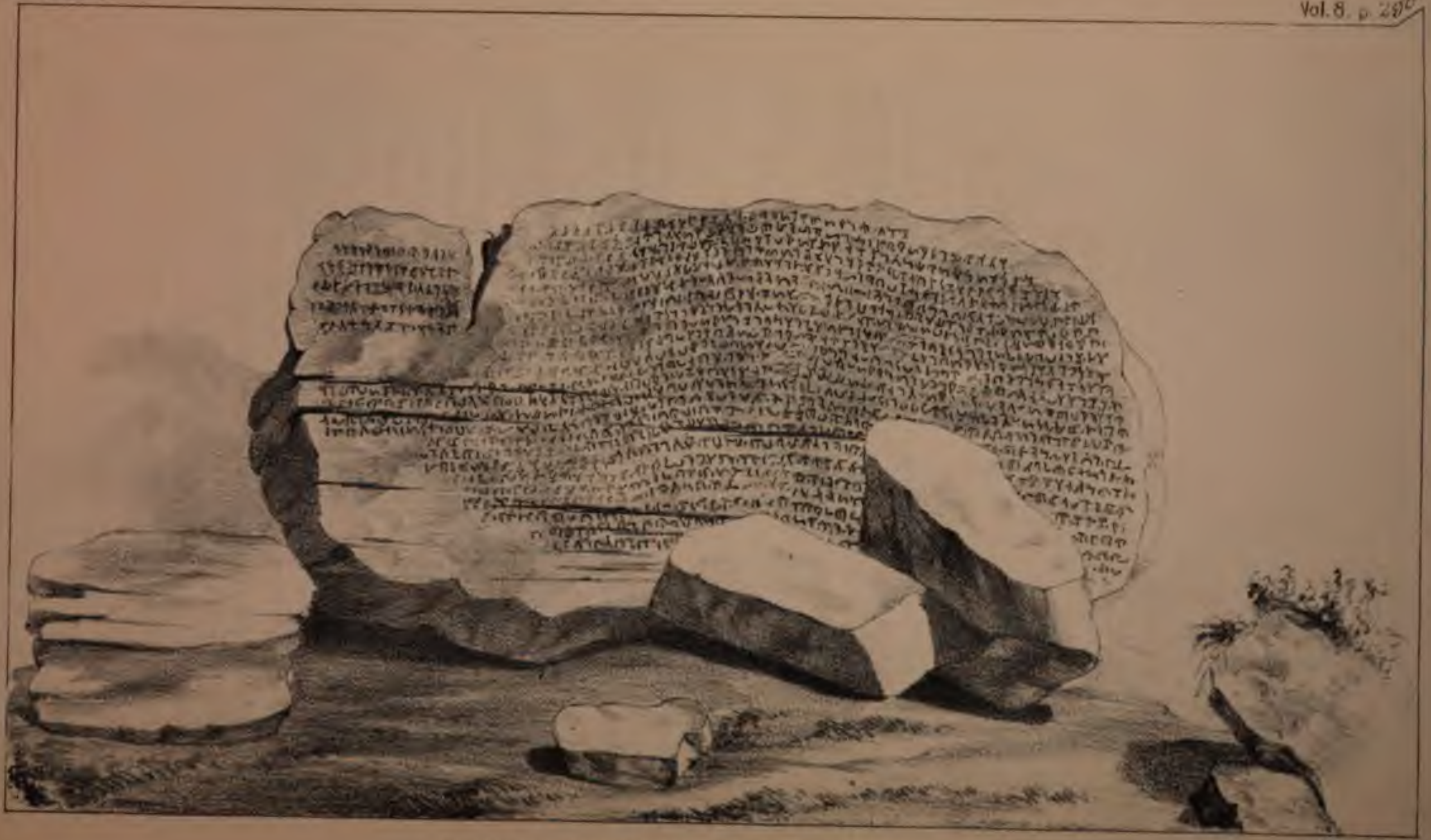


C. Masson del.

Plate 2.

Vol. 8. p. 296



C. Masson del^{t}

FRONT VIEW OF INSCRIBED STONE

latter ones; in all probability these deviations were due to the greater irregularity of surface. On the opposite side too, the upper lines of the smaller inscription there, were liable to the same observation. The lines moreover were not continuously straight, being carried out in an undulating course, as if the engraving had been influenced by the inflections of surface, which has produced a confused appearance, and was embarrassing when I wished to trace many of the lines throughout their full extent. Two or three horizontal fissures also occurred, which alike disturbed the clear course of the lines, one of which nearly traversed the whole breadth of the rock. M. Court's inscription was in a corner of the superior face, and separated from the great inscription by a perpendicular fissure: it was obvious, both from position and the style of the characters that this inscription was a distinct one. Here then were no less than three inscriptions in genuine Bactro-Pali characters. It may be conceived, I possessed sufficient inducement to encourage my companions to exertion, and that I willingly lent a hand to effect the removal of the moss. This was not so difficult a matter, we discovered, as to cleanse the rock from the green and slimy stains occasioned by the damp of ages. Nearly the whole day was expended in these labours, and after we had fairly succeeded, we passed over the surface a covering of prepared ink, as the preliminary to taking an impression on calico in the morning. This done we made our way to the village.

19th October.—Betimes we repaired to the rock, and having renewed the application of ink to the surface, we commenced the task of taking an impression. For this object, I had brought a large quantity of paper, of the stoutest fabric of Pesháwer, and twenty-five yards of fine British calico, which I had hoped from the representations of my young man would have sufficed for two impressions. We soon found that the paper would not answer the purpose, and it was plain that we had calico enough only for one impression; this however was effected, and constituted the labour of the day. The toil was great, as it was necessary to employ the palm of the hand, and forcibly too, to enable the gently moistened calico to accommodate itself to the irregular surface of the rock, and to produce the outlines of the characters. Of our success we could judge by the external appearance of the impressed calico, which on a black ground showed the characters precisely as they stood upon the rock, but as so many blank spaces. I was not altogether satisfied with the result, though as a first attempt, and the first impression that had ever been taken, it was still a tolerable effort. Having disposed of the superior inscription, we found that difficulties more serious than we could surmount, prevented us from repeating the process on the inscription at the opposite side. The lower part of the rock, on which it is engraved, slopes inwardly, while the soil on which it rests inclines outwardly, thereby forming an angle too acute to permit the free use of the arms. After fruitless endeavours to effect our purpose here also, I found that I must be contented to carry off a copy only.

As I purposed to devote the morrow to taking copies of the inscriptions by sight, we this evening exercised the ingenuity of the village smith in preparing half a dozen sharply pointed instruments, that we might the better trace and cleanse the channels of the letters. He converted for our use as many files, which he chanced to possess; and before we went to sleep, gave them to us prepared and tempered.

20th October.—At sunrise we were again at the stone, and with our new implements employed in clearing the letters of the inscription. After completing this part of our labours, we traced the letters on the rock with sharp angular pieces of a somewhat soft stone which we found in abundance around us. As the marks left by these stones were white, while the surface of the rock originally dark, had necessarily been considerably deepened in colour by the coverings of ink we had passed over it, the effect when the operation was terminated, was to ourselves surprising, and to our friends the villagers, little short of magical. They loudly expressed their feelings, affirming that they never had a notion that the entire stone was covered with writing, their knowledge having been confined to the obvious inscription of M. Court. They fully agreed with me that the Khán was a wonderful Khán, and that Sháh-Báz Kalendar was a cunning fellow, first to cover the stone with writing, and then to conceal the writing under moss.

In taking copies of the inscriptions, which was not done without difficulty from the waving and confused course of the lines, the young lad from Paráng proved serviceable to me, by guiding the end of a slender and long stick over the letters as I copied them, and by shifting it as I directed him. Towards evening, I had completed my copies of the three inscriptions, but after the pains that had been taken in clearing and bringing out the characters, I could not but regret being unprovided with fine calico, that I might take another impression of the superior inscription, under the advantages which would not fail to attend it. With little probability of success, but anxious that no attempt should be untried, I directed my young man to send for horses from the village, and to ride over with the Malek's son to Kote, and ascertain whether by chance, any calico could be procured among the

Hindú traders of the bazaar. During the day, I had essayed how far the coarse cotton fabric of the country would serve to bear an impression, but it had not answered. My young man returned from Kote, and to my great satisfaction presented me with twenty-seven yards of excellent British calico; a wonderful piece of good fortune; how so costly an article had found its way into the bazaar of a Yúsufzai village, I could scarcely account for; but its possession made me happy, and with light hearts we returned to supper and to rest at the village.

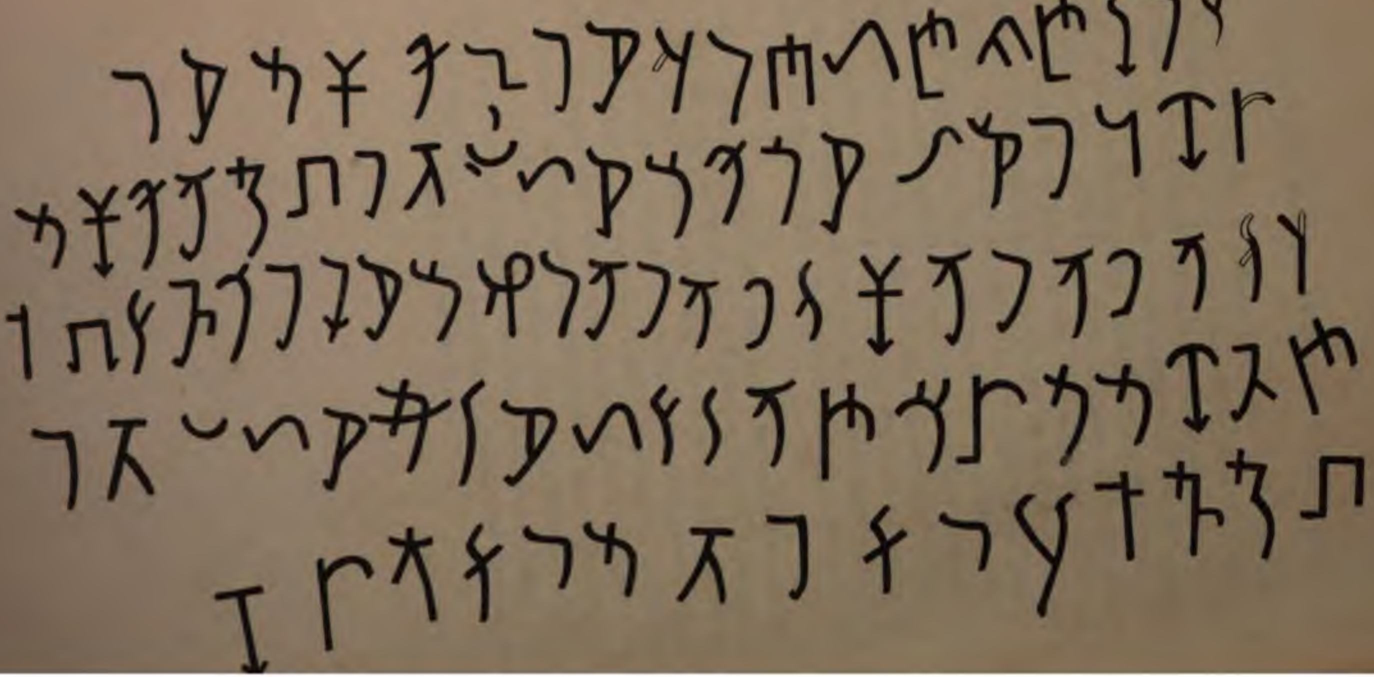
21st October.—By sunrise this morning we were anew occupied by taking a fresh impression of the large inscription. At noon, we heard the reports of cannons and small arms, which continued more or less sustained until afternoon, from which we inferred that Sirdár Saiad Mahomed Khán and his opponents had met in mortal conflict. We did not on their account remit our labours, but completed our impression in a manner, if not perfect, at least more satisfactory than the former one.

22nd October.—This day was spent at the stone, in completing our observations on it, and in the evening we retired to the village, with the intention of starting for Peshâwer in the morning.

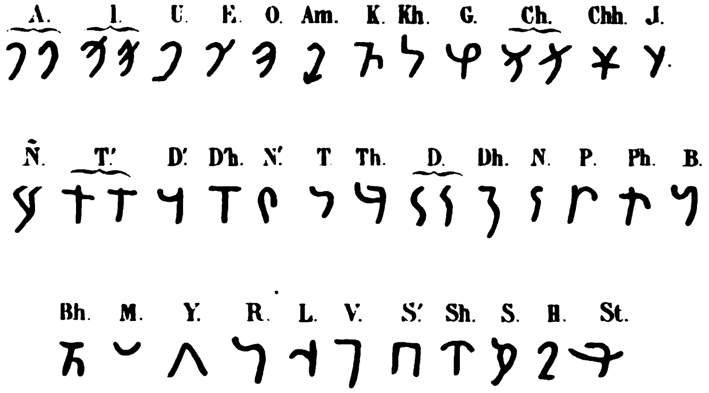
23rd October.—Two or three hours before daylight our horses were saddled, and we were ready to start. Malek Derú and the man he had commissioned to accompany us to Peshâwer were also ready. I was unable, although he was suffering from ague, to dissuade the Malek from attending us on the road, and urged to no purpose that it was ague day; I was also unable to send him back after he had proceeded a reasonable distance; he would and did keep us company until we reached the Kála-páni rivulet, being determined, he said, not only to see us safe in his own limits, but beyond them; we parted after a good deal of embracing, and I hoped the good old man would be able to reach his village before the ague fit came on. He must have been above seventy years of age; but he was hale, and on horseback active. Riding this morning on a mare, followed, as is the practice, by the foal, he dashed among the high jungle grass with great spirit and satisfaction, and was much pleased when I familiarly addressed him as Bai Derú, and alluded to the exploits of his youthful days.

We crossed the Kála-páni at daylight, and without halting at Hotti, committed ourselves to the plain before us. On nearing the mound before noted as between Hotti and Do Sir, we descried in the distance, but approaching us, a number of spears rising above the grass. They might be in hostile or in friendly hands, but we had only to encounter what happened as well as we could; we therefore

THE SEPARATE TABLET



THE ALPHABET.



The vowel a *is inherent in the consonants; the other vowels,* anuswara, *and* r, *are made by little strokes.* I *is drawn downwards crossing some line of the consonant: as* 𐨐𐨁 ki, 𐨟𐨁 ti, 𐨭𐨁 śi, 𐨯𐨿𐨟𐨁 sti; U *turns towards the left below, as* 𐨯𐨂 su, 𐨐𐨂 ku, 𐨱𐨂 hu; E *is made by a stroke above, as* 𐨯𐨅 se, 𐨭𐨅 śe 𐨙𐨅 ñe; O *passes downwards, but does not cross any line: as* 𐨧𐨆 bho, 𐨩𐨆 yo, 𐨯𐨆 so; Anuswara *is made by two strokes at foot: as* 𐨐𐨎 kan, 𐨭𐨎 śan: R *is a stroke towards the right: as* 𐨟𐨿𐨪 tra, 𐨭𐨿𐨪 śra. *Sometimes two such marks are found together: as* 𐨤𐨿𐨪𐨁 pri, 𐨤𐨂𐨪 pur, 𐨐𐨿𐨪𐨎 kram.

Vol. 8, p 303.

Art. XV.—*On the Kapur-di-Giri Rock Inscription.* By Mr. E. Norris.

[*Read March* 1, 1845.]

For above a month past, I had been trying at intervals, but without success, to decypher the Kapur-di-Giri Rock Inscriptions, which were brought to Europe by Mr. Masson; all of which had been copied by sight, and of which some also were fac-similes impressed on calico, in the manner which Mr. Masson has described. About ten days ago, on examining the copy of that portion which forms the back or south side of the rock, I remarked a group of letters of frequent occurrence, representing, according to the value attached to such of the characters as correspond with those on the coins of Bactria, the word *piyasa;* I found that the group was repeated frequently, and that in every case it was preceded by three letters which I could not identify. I had not the resource of a cloth impression, as Mr. Masson had found it impracticable to apply the calico to that part of the rock; but on comparing all the different examples together, I judged that the same group was always intended: in some cases the first letter took the form of *di*, as read on the coins; the second I read *r;* and the third *n;* this would make the word *Diranapiyasa.* I supposed this might be a name in the genitive case; and the supposition was corroborated by finding the same word, but without the final *s*, at the head of the separate tablet, which formed apparently the title of the inscription, and of which I had made a pretty fair transcript, by collating three calico impressions with the copy made by Mr. Masson on paper. A further investigation, and an examination of the list of names in Turnour's *Mahawanso*, convinced me that the word was *Devanampiya.* I immediately communicated this discovery to Mr. Dowson, to whom I had before given a corrected copy of the first separate tablet; and that gentleman, who unites a knowledge of Sanskrit to an acquaintance with the discoveries of Prinsep in Indian antiquities, proceeded to compare this tablet with the Girnar proclamation of *Devanampiya Piyadasi.* On doing this, he soon found that the inscription on the tablet coincided nearly with the seventh division of the Girnar monument. He lost no time in informing me of this coincidence; we proceeded to a closer examination, and found no greater difference between the two than might be expected between two different versions of the same original document.

I confess, that instead of feeling pleasure at having made this discovery, I was at first a little disappointed at finding that we had probably nothing more than a third edition of the Girnar monument, of which a second had been found at Dhauli, in Cuttack, and published with that of Girnar by Mr. Prinsep. But I remembered that the two versions already known had been found to differ in some particulars, and that the one now discovered might contain some new matter. I remembered also, that the complete acquaintance with the forms of the alphabet which so extensive a document must afford, would enable us to read with certainty the legends on the Bactrian coins, many of which still remain doubtful; and that with the alphabet, we should in all probability recover the language of the legends. I therefore proceeded to examine the remaining inscriptions, and I was not disappointed in the result. I began upon the portion which forms the front of the rock given in Mr. Masson's drawing, and proceeded, letter by letter, through the whole of it, collating every word with the Girnar inscription. I found the two documents to be similar, but not exactly alike; half the words are absolutely identical; but a considerable proportion of the remainder are effaced, or too indistinct to be recognised, though I have no doubt that I shall recover some by examining the impressed cloth more closely.[1] This portion contains all the Girnar tablets from the first to the eleventh, with the exception of the seventh, which was cut on the separate tablet before adverted to, and was the one of which a very imperfect copy was furnished to Mr. Prinsep. The second tablet is shorter than that of Girnar; the sixth has much additional matter; and the ninth differs considerably.

I then proceeded to the sheet containing the inscription on the back of the rock, which led me to the discovery, and I found that it contained, in substance, the three remaining divisions of the Girnar inscription, but at greater length. Here I was chiefly desirous of verifying the portion of the thirteenth tablet, which mentions the names of three western kings. In this I was deprived of the resource of a cloth impression, which had helped me to the clearing up of many words in the other portions; but very luckily the line which I wanted was, with one exception, perfectly legible: it confirmed Mr. Prinsep's conjecture as to the names of *Antiochus* and *Antigonus*, added a fourth name to those of the three kings, and dispelled all doubts as to the meaning of the word *Chaptaro*, which he thought signified Egypt. Mr. Prinsep read the lines thus: "And the Greek king besides, by whom the Kings of Egypt, Ptolemaios, and Gongakenos,

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[1] I have since received Mr. Masson's first attempts at taking impressions of the rock, and expect to derive much assistance from them; several portions illegible in the second impression, are very clear on the detached pieces, though these are on the whole the most defective.

(or Antigonus), and Magas, &c.," and conjectured that the Greek King was *Antiochus.* The Kapur-di-Giri inscription reads:—"The Greek King Antiochus also, and the *four* Kings, Ptolemy, Antigonus, Magas, and Alexander."[1] I have not yet had an opportunity of looking into the historical statements of those dark and troubled times; and cannot now guess at the monarch called Alexander, unless it be Alexander, the son of Pyrrhus, king of Epirus, who would I fear be too early; in all probability, the connexion between the East and Europe was not sufficiently frequent to maintain in India any very accurate acquaintance with the changes that were then so rapidly taking place in the West.

The Society has for some years been in possession of an accurate fac-simile of the Girnar inscription, which was probably taken after the lamented Mr. Prinsep wrote his account. I have examined the passage in question in this fac-simile, and I find there that the stone is broken off in the very part which probably did contain the name of Alexander; and that the name of Antigonus is quite distinct upon it, and could not be read *Gongakena,* as it was on the copy read by Mr. Prinsep; though he very ingeniously conjectured the true reading.

The alphabet in which the Kapur-di-Giri inscription is written, is in one respect more complete than that of the Girnar Rock. It contains three very distinct sibilants, and will thus often furnish a clue to the true reading of a word, which is wanting in the others. I think I find the cerebral letters also; but am not quite sure.[2] It is, however, unfortunately, less distinct, several letters being so like each other as to be easily confounded; resembling in this the old Cufic character, in which, according to Marcel, many words of three letters only, may be read above forty different ways, each having a real sense. It appears, also, to be sometimes deficient in vowels, though this arises without doubt from careless engraving, and perhaps still more frequently from the imperfect state of the impression; when fully legible, each vowel is expressed by a little oblique line in various positions; but no distinction is made between long and short vowels. The engraving on the rock is carelessly executed throughout; and in the very beginning, the name of the king is written *Priyasi,* instead of *Priyadarsi.* The language is like that of the Girnar inscription, but perhaps nearer to Sanskrit than that. The name

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[1] The name of Alexander is not quite positive; it looks as if preceded by a consonant,—perhaps *h*, making Halexander. Ptolemy, if correctly copied, is written Turamaro, and not Turamayo, as in the Girnar tablet; but the second *r* is uncertain.

[2] I have since distinctly found four of them.

Piyadasi is generally made Priyadarsí, always where fully legible; dhamma is written dharma; and the same forms occur in other cases. It will be understood that I have had no time for any critical remarks, even if my acquaintance with Sanskrit were sufficient to enable me to make any. My task will be to furnish an alphabet, and so far as I can, a legible text, which will be better read by others.

The portion given in the plate is the seventh edict, which forms a separate tablet on the rock, and is all that could be got ready for printing in the present Number. It is reduced on a scale of one inch to four, from a copy compiled by collating three impressions on cloth and three on paper, made by Mr. Masson. All these impressions are incomplete; but each contains some portion wanting in the others, and a letter or two has been obtained from the imperfect copy furnished to Mr. James Prinsep, which has been obligingly communicated to me by H. T. Prinsep, Esq. With all these aids, this part may be considered almost a fac-simile. I give what appears to me the reading in Roman characters, parallel with the readings of the corresponding portions of the Girnar and Dhauli inscriptions: the first from the copy taken by Mr. Westergaard, and published in the number of the Bombay Branch Society's Journal for April, 1843, collated with the fac-simile in this Society's possession, and the second as read in the fac-simile published by Mr. Prinsep; the letters in Italic are doubtful.

Girnar. —	Devánampiyo	Piyadasi	ráj*á*	savata	ichhati	save
Dhauli. —	Devánampiye	Piye*da*nsí	lája	sachata	ichhati	***
Kapur-di-Giri.	Devanampriyo	Priya[dar]śi	rajo	savatra	ichhati	sava

G.—	pásand́a	vaseyu	save	te	sayamancha	bhávasudhincha
D.—	hánand́a	vase *	ti save	*paga*	sachhaman	bhávusudhícha
K.—	pashand́a	vaseyu	save	ite	sayama*n*	bhavaśudhicha

G. —	ichhati	janotu	uchávacha	chhando	uchávacha	rago	te
D.—	ichhanti	munisá	*u*chavala	*chha*ndá	uchávúcha	lágá	te
K.—	ichhanti	janocha	uchavacha	chhando	uchavacha	rago	te

G. —	savam	vakásanti	ekadesam	cha	kasanti	vipú[su]le	tu	pi
D.—	sanvam	vá	ekadasa	* *	chati	vidalá	pi	ná
K. —	savam	va	ekadeśam	*va*pi	kashanti	vipule	pi	cha

G.—*dá*ne	yasa	násti	sayam*e*	bhávasudhi	tiva	katam	ñatá
D.—dáne	asa	na*th*i	dhayame	mávasudhicha			
K.—dane	yasa	ṅasti	sayama	bhavaśudhi		kit́a	ñata

G.—vadad́habhatitá	cha	nichá	bád́ham.
D.—		niche	b*au*d́ham.
K.—niva	bhatita	niche	pad́ham.

The alphabet given in the plate is not perfect, some letters in the large inscription still remaining doubtful; the single complete impression taken by Mr. Masson, and the damaged state of the rock, render that part much less legible than the small inscription; and some letters, or combinations of letters, have not yet been identified. The unmanageable size of the copy renders examination difficult; but it is being reduced for the lithographer, and the remaining letters will in all probability be identified before the appearance of the next Number, in which the whole of the Inscription will appear.

NOTE BY THE DIRECTOR.

The discovery announced in the foregoing notice by Mr. Norris is an unexpected and interesting accession to our knowledge of the Palæography and ancient history of India. There can be no doubt of the essential identity of monuments preserved through many centuries, by being inscribed on columns, or on rocks, in the most various and distant parts of the country; at Delhi, at Allahabad, in Behar, Cuttack, and Guzerat, and finally, in Afghanistan; originating with the same prince, and composed in the same language, with no other varieties than such as might be expected from difference of situation and defects of workmanship; curiously diversified, however, in the last instance, the case now under contemplation, by the use of a totally different alphabet, one written from right to left instead of from left to right, as in all the other inscriptions in India Proper, and corroborating the cotemporary currency of two sets of characters in the districts on the north-west frontier, of which we have had examples in the coins of Eukratides and Agathokles.

The concurrence of general purport which associates the inscription at Kapur-di-Giri with those of Dhauli and Girnar, as well as the light which they reflect upon the internal condition of India, and its relations with the neighbouring states, particularly with the Greek princes whose names are specified, will come most conveniently to be considered when the whole of the newly decyphered record shall have been prepared for the press. At present, it will be sufficient to offer a few observations on that portion which is now published, and which corresponds with the seventh Tablet of the Girnar and Dhauli incriptions, as decyphered and translated by the late Mr. James Prinsep, in the Journal of the Asiatic Society of Bengal, for March, 1838.

The inscription opens with the phrase which introduces all the rest, whether on columns or on rocks, *Devánámpriyo*, "the beloved of the Gods;" differing however from the rest in making the second member *Priyo* instead of *Piyo*, corresponding in this and other examples of the use of compound consonants more nearly with correct Sanskrit than with any of its Prakrit modifications. The termination of the singular nominative masculine in *o*, before a following hard consonant, is, however, the usual Prakrit inflexion.

The name of the king is next given *Priyaśi*, but as in every other inscription it occurs *Piyadasi*, and as the former would bear no known signification, while the latter is evidently the same as the Sanskrit *Priyadarśi*, "the kind or pleasant-looking," we cannot hesitate to regard *Priyaśi* as a blunder of the workman who cut the letters in the rock. Who *Priyadarśi* was seems to be still open to doubt, notwithstanding his supposed identity with *Asoka.* This identification still rests upon a solitary passage in a rare manuscript of an almost unknown Buddhist work, the Dípawanso, of which a copy brought to Ceylon from Siam, was procured by the late distinguished Pali scholar, Mr. Turnour. In that passage it is stated, that the inauguration of a prince named *Piyadasano* took place in the two hundred and eighteenth year after the disappearance of Sákya, and that he was the son of Bindusara, and the grandson, or as the unamended original has it, the grandson of the grandson of Chandragupta. The date and descent of *Piyadasana* sort well enough, it is true, with those ascribed to *Asoka*, in both Brahmanical and Buddhist traditions, and the circumstances of *Asoka's* conversion to Buddhism, the great zeal said to have been manifested by him in the extension of that faith, and his erection of innumerable pillars and temples, at least according to the chronicles of the Buddhists, would not be incompatible with the tenor of the edicts decyphered, and the number of places in which they are found. At the same time, it is rather inexplicable why the name *Asoka*, an appellation much better known than that of *Priyadarsana*, should never once occur. There are also chronological inconsistencies between the probable date of a grandson of Chandragupta and of Antiochus the Great, who is named in the inscription, and must have been either anterior to, or cotemporary with the author of the edicts. We need not however dwell upon these difficulties at present.

The title *Rajo* corresponds with the reading of the Girnar Tablet, whilst the inscriptions of Delhi and Cuttack have *Lája*, a mere vernacular variation. In *savatra ichhati*, "everywhere desires," the first word is nearer to the correct Sanskrit form *sarvatra* than the *savata* of Girnar. Mr. Norris has had access to different transcripts of the latter, to a fac-simile on calico belonging to the Society; a copy taken by Captain Postans, in the possession of Mr. H. T. Prinsep; another of an earlier period belonging to Mr. James Prinsep, and the copy printed in the Journal with corrections made by Mr. J. Prinsep, but of which the publication was prevented by his lamented death. A copy also taken by Captain Jacob and Mr. Westergaard, a distinguished traveller and Sanskrit scholar, has been published in the Journal of the Bombay Branch of our Society, for April, 1843. No material deviations from the copy printed in the Journal of the Bengal Asiatic Society, by Mr. J. Prinsep, occur, but occasional varieties are met with; one of these was *ivati*, as first read in the Girnar Tablet, but Mr. Prinsep corrected this to *ichhati*, and Mr. Westergaard gives the same reading. Their accuracy is confirmed by the Kapur-di-Giri inscription, in which the word is clearly *ichhati*, "he, the king, wishes or wills."

The words which are next given, as *Sava páshańda vaseyu*, translated by Mr. Prinsep "all unbelievers may be inclined to, or brought to," cannot be quite so readily recognised. The Girnar Tablet has *save*, which would more accurately represent the Prákrit plural of *sava*, "all." The mark denoting *e* is however easily obliterated, and the reading here may also be *save*. The use of what appears to be the cerebral sibilant in *páshańda* is correct Sanskrit, whilst the substitution of the dental *s* in the Girnar version, is neither Sanskrit nor regular Prákrit; all want however a termination here to denote whether the word *pashańda* be singular or plural. The chief difficulty however lies in the term *vaseyu*. It is clearly enough *vaseyu* in the Girnar Tablet; it is indistinct in the Dhauli inscription, and rather questionable in that of Kapur-di-Giri. Even, however, if the accuracy of the form be admitted the signification remains uncertain. Mr. Prinsep's Pandit supposed it to represent the third person plural of the potential mood of *vaś*, "to wish," or more usually, "to bring under subjection." This verb is written with the palatal sibilant, which is a letter of the Kapur-di-Giri alphabet also, yet the sibilant here employed is the dental. The Sanskrit form would also be *uśyu*, not *vaśeyu*, and the inscriptions usually conform to Sanskrit in the verbal inflexions which they contain. If it be part of a verb, therefore, it must be derived from the verb *vas*, with a dental sibilant, meaning "to dwell or inhabit," and the sentence will be, "may all the unbelievers abide." The following words, however, scarcely admit of this interpretation.

These are, according to the three several inscriptions, *save te*, *ti save paga*, and *save ite*; they are all doubtful; the second is unmeaning; the other two may be intended for *te save*, "they all," but they would then seem to be superfluous.

We have next, severally, *sayamancha bhávasuddhincha*, *sachhaman bhávasuddhicha*, and *sayaman bhavasuddhicha*. Mr. Prinsep's translation, including what precedes, is, "The king desires that all unbelievers may be brought to repentance and peace of mind;" but *sayaman*, "with moral merit," would not be a substantive but an adjective, or an adverb, and *bhávasuddhi* is purity of nature rather than peace of mind. The first may possibly be intended for *sanyama*, which means moral control; but the nouns could scarcely be objectives governed by the intransitive verb *vasa*, "to abide," any more than by *vaś*, "to subdue."

In the repetition of the verb *ichhati*, "wishes," as it occurs in the Girnar Tablet, Mr. Prinsep had no other singular nominative for it than *Raja*, and he renders it accordingly "He is anxious." The present inscription furnishes a somewhat different reading, concurring apparently with that of the Dhauli rock, and gives the verb in the plural, *ichhanti*, "they wish," as if governed by *save te*, "they all," that is, all the *Páshańdas*. This verb again may govern the nouns which precede it in the accusative case, although the second term has the sign of the case and is written *bhávasuddhin*, in the Girnar Tablet only.

The Kapur-di-Giri inscription agrees tolerably well in what follows with that at Girnar, substituting *cha*, "and," for *tu*, "but," as, *Jano cha uchávacha chhando uchávacha rago*. The Dhauli inscription has *Munisa* for *Jano*, a possible corruption for *manushya*, Sanskrit, "man," and the same therefore with *jano*, "man, or mankind." Mr. Prinsep translates the terms, "every diversity of opinion and every diversity of passion," a rendering which cannot be acquiesced in. As far as the words may be regarded as correctly decyphered, they would seem to express a general remark: "men or mankind are of various (high and low) wills—of various (high and low) passions," rather than a desire that they should be all of one way of thinking.

Te savam are the next words in all three. The Girnar Tablet has next *vakásanti;* the other two have only *va*. In some of the transcripts of the former the word is *vakásati;* but if the nominative be *te*, "they," the latter, which is in the singular, must be incorrect. There is no necessity to impute a defect to the other two inscriptions, if we suppose *va* to be properly *vá*, "or," the use of which obviates any occasion for the actual reiteration of the verb *kásanti*, as it occurs in the Girnar Tablet.

We have next in the Girnar Tablet *ekadeśam cha kásanti* (or *vakasata* or *vakasati*), in the Dhauli inscription *ekadasa chati*, and in that of Kapur-di-Giri, *ekadeśam va pi káshanti*. The Dhauli inscription is defective; the two others nearly agree. Mr. Prinsep's translation, in continuance of the preceding and immediately succeeding sentences, is, "he is anxious that every diversity of opinion," &c., "may shine forth blended into one system, and be conspicuous, in every undistinguishing charity," this translation depending on the meaning of the verb *kás*, "to shine." But this version takes no notice of the contrast presented by *savam*, "all," and *ekadeśam*, "a part;" and it is not at all certain what the verb should be. *Káś*, and *kás* with a long vowel and a final palatal or dental sibilant, have, it is true, one of their meanings, "to shine;" yet this is in a literal sense, and they could never be the equivalents of "being conspicuous." In the present inscription also the verb is written with a short vowel, and the cerebral sibilant, as *kash;* and *kash* in Sanskrit means "to kill." It may also fitly represent the Sanskrit *krish*, or *karsh*, "to draw or attract." The translation suggested to Mr. Prinsep by his Pundit cannot therefore be relied on.

The present inscription supplies a necessary correction of the word that follows. The Girnar Tablet was read by Mr. Prinsep *visule*, with the remark that the second syllable was doubtful. The Dhauli reading is *vidala*, which did not tend to clear up the perplexity. In Mr. Westergaard's copy of the former the word is *vipule*, and this is now established by the Kapur-di-Giri inscription. The whole phrase in the latter is *vipule pi cha dane;* in the former tablet it is *vipule tu pi dane*, in which *pi* for *api*, "indeed," seems to be transposed. In Mr. Prinsep's translation these words were connected with the preceding, as in the passage already cited, "in every undistinguishing charity;" but whether we read *cha* or *tu*, "and" or "but," the particle separates the sentences, and detaches "gift" from any government of the verb *kásanti*, even if such connexion were syntactically accurate, which it is not. We must understand *dane*, therefore, as standing alone, being in fact the ablative absolute, and render the phrase in a sense which admits of no question, "but great gifts being given," or "where there is great munificence:" this will also connect well enough with what follows, "he of whom there is not moral restraint and purity of disposition," *yasa nasti sayama bhavasuddhi*, which is the reading of both the Girnar and Kapur-di-Giri rocks. The Dhauli inscription is evidently incorrect, but in using *nat'thi* in place of *násti*, it only substitutes the Prákrit form of the verb for the regular Sanskrit which is employed by both the others.

In the Girnar inscription we have next *tiva*, or *táva;* the former is unmeaning, the latter might be intended for *távat*, "so far," "inasmuch as;" the Dhauli inscription has in place of it *cha*, "and." There is no word in this place in the Kapur-di-Giri inscription; the sense seems to require some term that might be the correlative of *yasa*, "whose," as *tasa*, "of him." There is a blank in the following part of the Dhauli inscription which the other two agree in occupying with *katam-jn'atá*, or *kita-jnata;* both intended, no doubt, for the Sanskrit *kritajnatá*, "gratitude," not as the Pundit proposed to Mr. Prinsep, "supreme wisdom." The whole of the translation given in the Journal is here evidently very far wide of the truth, although it may be admitted that it is not easy to suggest a better, for all the rest of the original presents in either of the two most perfect inscriptions, a passage which cannot be satisfactorily interpreted, or even read with any degree of confidence.

The syllables that complete the portion of the inscription under review are in the Girnar version *vadád́ha-bhatita* (or *vadavabhatáta*), *vanivá-bád́ham* (or *che-ni-cha-dhanám*), for all which we have at Dhauli but *cha-niche bad̀ham*. The Kapur-di-Giri inscription conforms more nearly to the first, and has *niva-bhatita-niche-pád́ham*, a combination equally perplexing. We have first to determine how these syllables shall be divided into words, and then what the words signify, but I must confess myself unable to fulfil the first part of the condition, and as I cannot propose any satisfactory words, of course I suggest any interpretation as mere matter of conjecture. It may be thought that, as they are probably connected with *krita jnatá*, "gratitude," they may import that the acknowledgment of munificence will overlook want of moral desert, even in the base, *nicha* signifying "low," or "vile." The last word in the Kapur-di-Giri inscription, *pad́ham*, may be the equivalent of the Sanskrit *prathama*, "first;" or it may be intended for *prashtham*, "asked." The former would apparently lead naturally into the next or eighth portion of the inscription, which begins, according to Mr. Prinsep, "in ancient times," and not as usual, with *Devanam piyo*. It seems not improbable that the sentence does not terminate in this portion, and that either something is wanting, or that it leads into the next; at any rate, it is quite impossible that the concluding sentences of the seventh Girnar Tablet should admit of the translation of the Journal: "Unto no one can be repentance and peace of mind until he hath attained supreme knowledge, perfect faith, which surmounteth all obstacles, and perpetual assent." Mr. Prinsep states his dependence upon his Pundit for the interpretation of the documents, and although Kamala Kánta, by whom he was assisted, was a man of great learning and ability, yet the inherent difficulties of the task were more than he could overcome, and he was obliged to make up by ingenious conjecture for the deficiency of his knowledge and the imperfections of his text.

Although I cannot pretend to offer a translation of this part of Priyadarśi's proclamations which shall not be as liable to exception as that of my old and esteemed acquaintance Kamala Kánta, who is no longer living to vindicate his own work, or retaliate upon mine, yet it may be convenient to put together the results intimated as possible or probable in the foregoing remarks, if it were only to render them more amenable to criticism. I venture, therefore, to suggest the following as something nearer to the purport of the original than the former translation.

"The beloved of the gods, the Raja Priyadarsi, desires that all unbelievers may everywhere dwell (unmolested), as they also wish for moral restraint and purity of disposition. For men are of various purposes and various desires, and they do injury to all or only to a part. Although, however, there should not be moral restraint or purity of disposition in any one, yet wherever there is great liberality (or charity), gratitude will acknowledge merit even in those who were before that reputed vile."

Whatever may be thought of the exact rendering of this part of the inscription, it seems very likely that the Raja intended by it to recommend his own example to his subjects of every denomination in every part of India, and to encourage them to imitate him in the construction of works of public ornament or utility, and in the distribution of charitable gifts.

GEOLOGY OF SOUTHERN INDIA.

THE following Notes have been received from Captain Newbold since the printing of the earlier pages.

NOTE TO PAPER ON DIAMOND SANDSTONE AND LIMESTONE (pp. 156—171).

THE following note is from Mr. Piddington on a mineral recently discovered by Captain Newbold in the shales of the limestone of Gazopilly Eastern Gháts, associated with galena, quartz, calcspar, and sulphate of barytes:

"I have the pleasure of informing you that your red mineral is, as you supposed, an ore of cerium; and moreover, of that most rare kind, carbonate of cerium. It contains iron, lead, lime, silex, alumina, and perhaps, yttria and magnesia."

ADDITIONAL NOTE TO PAPER ON TRICHINOPOLY FOSSILIFEROUS LIMESTONE (p. 218).

SINCE my first paper on the Trichinopoly fossiliferous limestone, Captain Lawford, of the Madras Engineers, has kindly examined for me, more accurately, the limits and geological relations of these beds, and I have much pleasure in forwarding the following abstract of the notes he sent me, as a valuable *addendum* to the paper alluded to, with a few brief remarks of my own.

It will be right to premise that these notes commence at the N.E. extremity of these beds, following the strike of their stratification in a S.W. direction from the south bank of the Vellaur towards the valley of the Coleroon.

Keranoor, Olapaudy, and Varagoor.—Proceeding easterly along the right bank of the Vellaur from Keranoor, a tappal station on the Madras road about forty miles road distance N.N.E. from Trichinopoly and Vudakaloor, where a deep black soil covers the rocks, hornblende schist is the first rock seen, and hornblende rock in loose rounded blocks; they occur a little to the south of the Chennaur, a tributary to the Vellaur. The hornblende schist is in nearly vertical strata running east and west, and forms the base of a gentle acclivity in which were first seen the beds of fossiliferous limestone, which is found about four feet below the surface. The upper soil is a light brown mould containing much kunker, which also encrusts the limestone. The dip of the latter is towards the south, at an angle of ten degrees; the thickness of the beds could not be measured, but the height of the ground may be about one hundred feet above the stream. Proceeding south-east from Olapaudy, Captain Lawford passed along the western base of this acclivity, and still observed the hornblende as the underlying rock. In some quarries in the limestone, from which blocks nine feet by two and two feet and a half were being cut, the stratification was very distinct: dip and direction as before. Three feet below the surface was a layer of limestone with fossils nine inches thick, overlying a layer three or four feet thick of friable calcareous earth (marl), in which no fossils were observed, and which intervened between the upper and lower or main fossiliferous beds; immediately below the latter was the hornblende. About a mile farther the ground declined gradually to the south, and the soil became black alluvium. Three miles farther small rounded blocks of hornblende were seen: and at Varagoor, where the Olapaudy high ground terminates, were some rounded blocks of the fossiliferous limestone embedded in kunker in the bed of a stream.

From Varagoor to Shantanoor.—From Varagoor to the S.E. much hornblende rock was observed; and at three miles' distance, on another rising ground, the black limestone embedding great quantities of shells was met with. Black soil and hornblende rock succeeded as far as the bed of a stream, where rounded blocks of the fossiliferous limestone were found embedded in sandstone. Dark alluvial soil continued to Shantanoor.

Garoodamungalum ridge.—From Shantanoor the country continued of the same character as before. At five miles the fossiliferous rocks were observed in the bed of a stream: dip and direction as before. A fossil nautilus was found here. From this stream the ground rises to the S.E., and a ridge of fossiliferous rocks runs due north and south as far as the eye can reach. They formed the eastern slopes of the acclivity, on the top of which stands Garoodamungalum, on a sort of plateau, the western slope of which consists of a ridge of rocks, parallel and similar to the one above mentioned. This plateau and the ridges of rock were described to Captain Lawford as extending about five miles to the south and as many north. The rocks are a blue fossiliferous limestone: dip and direction as before, soil reddish brown.

To Pervullapoor.—Continuing south, hornblende rock and the limestone were seen occasionally; but the fossils gradually disappeared, and the last limestone noticed was at Pervullapoor, where it is yellow, schistose, and without fossils.

South base of the Fossil Tract and Valley of the Coleroon.—Beyond this, trap (basaltic greenstone) and quartz prevailed, and in another high ridge running east and west, overlooking the Coleroon, gneiss and granite. The great valley of the Coleroon and Cauvery, watered by numerous divisions of those rivers, is covered with a rich alluvium, which probably has its basis on the granite and hypogene rocks. Granite is seen on the opposite bank near Trichinopoly, occasionally overlaid by laterite, and occurs in the rock-islands in the river bed.

Western flank of the Fossil Tract.—At the western base of these fossiliferous ridges, along the line of Madras road, from the alluvium of the Coleroon on the south, to Keranoor on the Vellaur (whence we started) on the north, granite is seen between the Coleroon and Samiaveram. The soil is red, with much quartz and occasional rounded blocks of trap; between Samiaveram and Siriganoor, black cotton soil appears covered with much loose stone, chiefly trap and quartz; beyond the last place is a plain of deep cotton soil, succeeded by soil containing much kunker and loose trap.

About Ootatoor the rock is exclusively hornblende, rounded blocks of which literally cover the ground and form small eminences; hence to Toramungalum hornblende is the only rock visible, with abundance of kunker; the soil chiefly black alluvial. The same continues to near Volconda, where a calcareous schist is observed, and also magnesite; the latter in loose nodules and masses embedded in the soil; hornblende prevails also. The schist has a direction N.E. and S.W.: dip about twenty degrees. From Runjanguddy to the Chennaur, near which we started, hornblende rock continues with much kunker, and is seen in the bed of the stream; thence to the Vellaur, a plain of deep black soil extends, above which little rock is visible.

Such is the drift of Captain Lawford's notes on these interesting and partially explored deposits, which have been now traced so far south as the north edge of the Coleroon valley. It will be seen that if a line be drawn from this S.W. point at Pervullapoor, through the major axis of these deposits, it will pass in a N.E. direction through or very near to those of Verdachellum and Pondicherry, comprising a direct distance N.E. of about one hundred miles. On referring to the Map we shall find that the larger gaps which now separate these deposits, are occupied by the valleys through which flow the principal rivers of this part of India to the Bay of Bengal, viz., the Panaur and Vellaur. Whether the valley of the Coleroon separates the Trichinopoly deposits from others still further to the south or S.W. at intervals to Cape Comorin, remains still to be shown, or whether they here terminate or have been swept off by denudation. It seems probable, that though there may be differences in the ages of the fossiliferous strata, they once formed a continuous ridge, or parallel ridges, elevated gradually with the land from the bed of the sea to the different conditions of a sea beach, and subsequently of a coast ridge, and that the gaps we now see in their continuity, inexplicable by the supposition of the eroding powers of present streams, were formerly the sea embouchures of ancient lines of drainage, the directions of which have since but little changed.

The present height of the fossil beds above the Coleroon Captain Lawford states to be about two hundred feet, and that the surface of its area is undulating. The unconformable and smaller amount of dip relatively to that of the hypogene rocks on which they immediately rest, shows that the former had suffered great disturbance prior to the deposition of the limestone: but it is evident that the latter has partaken of the later disturbances which have affected the hypogene rocks, and lastly has been raised with them from the ocean's bed.

Fossils collected from the upper layer, described by Captain Lawford as separated by a non-fossiliferous stratum from the lower beds, should be kept distinct, as it is possible they belong to distinct epochs.

Art. XVI.—*Analysis of the Ganeśa Purána, with special reference to the History of Buddhism. By the* Rev. Dr. Stevenson.

[*Read January* 4, 1845.]

Thinking that the Gańeśa Puráńa might throw some light on the origin of the Saiva worship, I lately took it up to examine it in that relation. I had not proceeded far in this investigation before I was fortunate enough to meet with two legends, which I conceive have a distinct reference to the rise and fall of Buddhism in India. One of these is contained in the first, and the other in the second khanda or division of the Puráńa; and to their consideration I shall devote this paper, after a few brief general remarks on the work itself.

The former called the Upáśana Khańda of the Puráńa, could scarcely have been written before the seventeenth century of our era, as Moreśvar (*Sans.* Mayúreśvara) is mentioned as a great Tírtha of Ganeśa; but till Morabhatta, who flourished in the former part of that century, gave it celebrity, and originated the Chinchore (Chinchvad) incarnate Gańapatis, it was a place altogether unknown to fame.

The Puráńa commences with the misfortune of Somakánta, king of Surat (*Sans.* Sauraráshtra), who, on account of the affliction of leprosy, left his home and kingdom to wander in the wilderness. While roaming about from place to place, he came in contact with the sage Bhrigu, one of his progenitors, who retailed to him what Brahmá had in ancient times related to Vyása in praise of Gańeśa. The sum of the whole is, that Gautama, Saubhari, Kaundinya, Viśvámitra, and all the Rishis, recommend to sundry applicants for ghostly advice the worship of Ganeśa, and the repetition of the two *mantras*, the one, *Sri Ganeśáya namah*, and the other the mystic *Om*. Indra, Siva, Vishnu, Paraśuráma, Skanda, &c., are all represented as having failed in their projects till they applied to Gańeśa, through whose aid alone they were enabled to perform their exploits. Bhrigu, therefore, in conclusion, sends away his pupil Somakánta to get rid of his disease, the consequence of sins committed in a former state, by worshipping Gańapati on the 4th of Bhádrapad, according to the institute in which he had instructed him.

The second Khańda of the Puráńa refers to the first, and therefore must have been written after it. Súta is there introduced as relating to the assembled sages what Bhrigu had rehearsed to Somakánta, and Brahmá originally narrated at the request of Vyása. To extol

Gańeśa above all other objects of religious adoration is equally the purport of this second division. In the Puráńa, two distinct modes of worshipping Gańeśa are pointed out. At one time he is identified with the supreme spirit, Paramátmá, the Brahma of the Vedantists, and is to be worshipped by mystical contemplation alone. The other mode by which religious homage may be paid to him is, the forming the image of the god, crowning it with flowers, presenting to it offerings, and celebrating the annual festival of Gańapati.

The particular legend in the first division of the Puráńa to which reference has been made, and which is interwoven with the principal theme after the manner of the episodical stories in the Panchopákhyána and the Arabian Nights, commences with the History of Gritsamada. The grandfather of this sage was named Bhíma, and was sovereign of Vidarbha, the modern Berar. His capital city was named Kauńdinya after the sage of that name. The king had no children, which so afflicted him, that he left the city with his wife to wander in the forests and propitiate the deity. In his wanderings he met with Viśvámitra, who directed him to worship Gańeśa. The deity proved propitious, and he had a son named Rukmánga, who, after ariving at manhood, and having been associated with his father in the government, one day lost his way while hunting in the woods, and came to a Rishi's hermitage. The sage's wife fell in love with the king, and when he refused to listen to her unlawful request, she cursed him, and brought on him the affliction of leprosy, from which he was freed only by applying to Gańeśa. Meanwhile Indra, whose character the Puranic writer seems little studious to exalt, is made to assume the form of the virtuous prince, and gratify the licentious passion of the Rishi's wife. The fruit of this connection was the sage Gritsamada, who, in the Index to the Rig-Veda, is mentioned as being the Rishi of certain portions of these sacred hymns. The circumstances of his origin were unknown to the sage himself, but not to the other Rishis, who, when he had joined himself to their society on the occasion of a Sráddha performed by the sovereign of Magadha, reproached him with his spurious descent, and calling him the son of Rukmánga ordered him to quit the assembly. Stung to the quick by their reproaches, Gritsamada went to his mother, and on her acknowledging her guilt, he cursed her, imprecating on her the doom of becoming a Jujube tree[1] after her death, an event which followed soon after. She in return imprecated on him the doom of becoming a Brahma Rákshas. No change of form however befel the sage, nor did he require to die and be born

[1] कण्टकी or बदरी

again; on the contrary, the curse, as far as external circumstances made any change apparent, seemed to come upon him in the shape of a blessing. He courted no more the society of the *Rishis,* but after a short abode with certain *Munis* of a different profession, he betook himself to meditation on the Supreme Being, standing on his great toe with his mind intensely fixed on the deity. The divinity, identified as usual in this Puráṅa with Gaṅeśa, but possessing all the attributes of the Vedantist Brahma, appeared to him, and granted all his requests, Brahma Rakshas as he was, and still styling him Brahman and Sage[1], accorded to him, as he desired, pre-eminence in all his transmigrations above other Brahmans, divine knowledge[2], along with a beautiful shrubbery[3], in which he might engage himself in divine meditation. After this the whole band of sages[4] paid him the greatest respect, honoured him as their chief, and even went so far as to worship him with oblations[5]. Gritsamada still continued to meditate on the divine essence, absorbed in intense devotion. One day as he opened his eyes, he saw, at a great distance before him, something like an infant cast out in its blood, uttering mournful lamentations. His merciful disposition was sensibly affected, but after closing his eyes for a little while, he found on opening them again a beautiful boy coming up to him, who saluted him as his father and mother, saying that he had been given to him by the deity, and promising him all obedience, if he would adopt him and take him under his protection. Gritsamada complied with the child's request, taught him the mystic incantation OM, and sent him away to stand on his great toe contemplating the supreme Gaṅeśa. After some thousands of years the deity, propitiated by his austerities and the victory he had obtained over the senses and passions, appeared to him and desired him to ask a boon. The child asked the power of conquering the three worlds, which the divinity accorded, promising at the same time that he should be incapable of falling by any weapon except that of Siva, that he should possess three famous cities, one of iron, one of silver, and one of gold, and that on leaving the world he should be absorbed in the divine essence.

This child was no other than the famous Tripurásura, who speedily set to work, and by the assistance of certain others whom he created, vanquished Indra and all the gods, sent them away to hide themselves in the caverns of the Himálaya Mountains, and reduced them to the greatest state of leanness and distress, by putting a stop

[1] विप्र and साधु [2] ब्रह्मज्ञानं [3] पुष्पकं वनं [4] मुनिगणाः

[5] यज्ञकर्माणि Adhyáya XXXVII. Sl. 35—39.

to the offering up of the oblations which mortals had been accustomed to present to them. After taking possession of Brahmá-loka and Vaikuṅtha, sending Brahmá to his lotus bed, and Vishnu to the sea of milk, he went to Kailás and asked Siva to give it up to him and retire to Mandara, with which request, after a little grumbling, the good-natured deity complied. The gods in this sad predicament apply to Nárada, who, although ready enough to create, on suitable occasions, a little merriment at their expense, was ever ready to help them when they were really in distress. He recommends to them the worship of the Supreme Being; telling them, that it was by adoration of the supreme Gaṅeśa that the Daitya had attained the pre-eminence he enjoyed, and that their affairs could be retrieved only by the adoption of the same mode of worship. The gods and Rishis take his advice, and at last obtain the favour of the deity, who promises to take their case into consideration and provide an effectual remedy. For this purpose Gaṅeśa disguises himself in the form of a Brahman, and accosting Tripurásura, told him that he could build him such a city as could be equalled neither in heaven nor on earth. On receiving the Asur's command to proceed with the work, he built for him the three famous cities, one of iron, one of silver, and one of gold. On being asked what boon he required for such a signal service, the cunning Brahman, in order that he might bring on a collision between the Asur and Siva requested the marble image of Gaṅeśa called Chintámani, which was placed at the entrance of Kailása. Tripurásura readily agreed to grant him such a trifling compensation for his important services. Yet, although in possession of Kailása, he considered it wrong to remove any of the furniture of the place without first going through the ceremony of asking Siva's leave, and accordingly sent two messengers to ask the god to give up the image. The Asur's messengers, in making this request in the name of their master, gave no obscure intimations that if the image were not given up on their requisition, force would be used to extort compliance. This was too much for Mahádeva, who getting into a rage, refused to accede to so unreasonable and uncivil a demand. On this Tripurásura mustered all his forces and attacked Siva, who advanced to meet him at the head of all the gods. The celestial armies were again routed, and their leader, the great Mahádeva himself, was obliged to make off, and skulk about the precipices, and lurk in the caverns of the Himalaya mountains, while the Asur bore off the famous image Chintámani, the subject of the dispute, in triumph to Pátála. Mortified and downcast at this defeat, Siva made no attempt to retrieve the affairs of the gods, till the faithful Nárada came to him and instructed him in the worship of the supreme Spirit. After Siva had waited in the austerest devotion for ten years on the supreme Gaṅeśa, the god appeared to him, and after telling him that neither the divine Rishis, Brahmá, the Vedas, the Upanishads, nor the six Sástras, were acquainted with his person[1], informed him that he was propitiated by his austerities, and would grant him the boon he desired, namely, victory over Tripurásura. To make his triumph more certain and complete, Siva extols Gaṅeśa in a hymn, in which every one of his thousand names is recited. The Asur can no longer withstand the might of the gods, who, through the blessing of the supreme Gaṅeśa, and the generalship of Siva, obtain a complete victory. Mahádeva with his fiery darts consumes the three cities, and the Aśur, no longer able to maintain his ground on earth, darts away as a brilliant meteor, and mingles with the divine essence.

If we are to suppose that this legend is nothing more than a flight of Brahmanical fancy, and that no allegory lurks under the external guise of a long subjection and protracted war of all the gods with a particular Asur, we shall do little credit to the wisdom of the sage by whom it was conceived; but if we suppose it to be an allegorical representation of the conflict between Brahmanism and Buddhism, we have a subject worthy of the poet's genius, and obtain an extremely interesting, as well as probable account of that memorable struggle.

We need not question the strictly historical accuracy of all the events cognizable by man which befel Gritsamada. The spuriousness of his origin, his vast learning, his quarrel with the Brahmanical Rishis, his association with Munis of a different order, his devotion to the worship of the Supreme Divinity, and adoption of a ritual differing from that esteemed orthodox, are all circumstances that need not be called in question. His adopting Tripurásura and teaching him the science of Divinity are also probable events. But the important questions are, what profession did Gritsamada adopt after he was expelled from the society of the Brahmans? Did he become a Buddhist, and is it the history of Buddhism our author is here giving under the veil of the legend of Tripurásura?

To enable us to answer satisfactorily these questions; the following considerations, evidently deducible from the narrative, require to be kept in mind.

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[1] न मे स्वरूपं जानन्ति देवर्षिश्चतुराननः ।
न वेदाः सोपनिषदः कुतः षट्शास्त्रवेदिनः ॥
Adhyáya IV. Sl. 33.

1. During the new state of things introduced by Gritsamada and Tripurásura, according to the Purána, an entire stop was put to the performance of the Brahmanical ceremonies. This is expressly stated Adhyáya XL. Sloka 9—12. "Having brought in subjection all the gods, the Asur returned to earth, and the powerful Bhimakáya, subduer of the world, by his might brought in subjection all the kings, put the Rishis under restraint, shut up the fire temples[1], broke down everywhere the hermitages and holy places of the devotees, seized the houses erected as refuges to the religious;—and bloated with pride, set himself always in opposition to sacrifices to the gods[2], oblations to the *manes*[3], burnt-offerings[4], the study of the Vedas, and religious ceremonies."

No language can more fully describe an entire proscription of all the peculiar rites of the Brahmanical religion than this. It forms a comment on the aphorism quoted in a former paper[5], in which the Agnihotra, the offering of flesh to the *manes*, &c., are declared prohibited in the Kaliyuga.

If we turn from the Brahmanical to the Buddhist records, we find in the account of Aśoka in the Mahavanso, that at the beginning of his reign, while following the religion of the Brahmans, he was in the habit daily of sacrificing a multitude of cows, but that he put an entire stop to this, and to the feeding of Brahmans, on his conversion to Buddhism. The first edict of this prince, as found engraved to this day, on stone pillars in various parts of India, interdicts the offering up of any animal in sacrifice, as well as killing them for the sake of food, thus abolishing one essential rite of the ancient Brahmanical ritual, as I have shown in a former paper[6]. Buddhism then produced the same effects as the government of Tripurásura in regard to the rites of the Brahmanical worship.

2. Indra, in the old Brahmanical system, was the creator of the world, and chief among the gods, sustaining in fact the attributes, and performing the works of the Brahmá, Vishnu, and Siva of modern Hinduism; while in the system of Tripurásura, Indra holds a place inferior to the Asur himself, and has no divine honours paid to him. The second Mańdala of the Rig Veda, being the latter part of the second Ashtaka, consists entirely of hymns, the composition of Gritsamada, who makes such a figure in the legend under review;—all doubtless composed before he had changed his principles and

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[1] कुण्डानि [2] स्वाहा [3] स्वधा [4] वषट्

[5] Journal of the Royal Asiatic Society, No. XIII., p. 2.

[6] Journal of the Royal Asiatic Society, No. XIII., pp. 3, 4.

abandoned the Brahmanical religion. It cannot be unfair then to take the character of Indra in the ancient system from those authoritative hymns of his, which have been deemed worthy of a place in the Veda itself. It is as follows:—

1. O mortals, it is Indra, who is the first born, the intellectual, the divine, who protected the gods by his meritorious works, whose forces made the two worlds tremble, and who is great in might. 2. It is he who rendered firm the trembling earth, and established on their foundations the shaking mountains, who spread out the firmament, and caused the orb of day to ascend aloft. 3. Who, when he had slain the cloudy demon, made the seven rivers flow, who brought forth the cows which the Asur Bali had concealed, and produced fire from the midst of the watery cloud, destroying his foe in the conflict. 4. By whom all creatures that move on the earth were made, who formed the servile tribe that dwell in caverns under ground, and conquering the myriads of his foes brought down their power with the ease a hunter does (a stag[1]).

Such is the character of Indra given by Gritsamada while a votary of Brahmanism. Indra is the creator of the earth and sky, and of all their inhabitants, the preserver of the pious, and the destroyer of the impious; but the pupil of the same Gritsamada, who had learned his system from him after his change of creed, is described in our Purána as ascending to heaven, meeting Indra in hostile conflict, knocking his thunderbolt out of his hand, and after a struggle getting hold of him by the feet, whirling him round and round, and throwing him into a region no one knew where, and in the end seating himself on Airávata and taking possession of the throne of heaven[2]. We have only to turn over a few pages of the Mahávanso to find that Sakko (Indra), though dignified with the name of god, is a being of no esteem among the Buddhists, and receives no divine honours, these being all reserved for Buddha and his Theros.

3. Contemplation of the Supreme Being is represented as a mode of divine worship practised by Gritsamada and Tripurásura, while

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[1] Ashtaka II. Adhyáya 6. Varga 7.

यो जात एव प्रथमो मनस्वान् देवो देवान्क्रतुना पर्यभूषत् ।
यस्य शुष्माद्रोद सी अभ्यसेतां नृम्णस्य मन्हा स जना स इन्द्रः ॥
यः पृथिवीं व्यथमानामदृंहद्यः पर्वतान्प्रकुपितान् अरम्णात् ।
यो अंतरिक्षं विममे वरीयो यो द्यामस्तभ्नात स जना स इन्द्रः ॥ &c.

[2] Adhyáya 39.

unknown both to the Brahmans and the Saivas, though afterwards adopted by both parties for the purpose of subduing the Asur.

It is plain from a review of the Vedas that sacrifices, and singing hymns to Indra, Agni, Soma, and other gods, now considered by the Hindus of an inferior grade, was the highest form of divine worship known to the ancient Brahmans. In the Bhágavat Gíta the Sáma is considered the holiest of the Vedas. It is preserved by the Brahmans with a care, and its hymns sung with a reverence, that plainly mark the veneration in which it is held. I found far less difficulty in the west of India in obtaining copies of the other Vedas, than I did in procuring those of the Sáma, and yet it consists entirely of hymns to the above-mentioned divinities. Siva and Brahmá are never even mentioned, and Vishnu is rarely invoked, and then only as subordinate to Indra.

On the other hand, Gritsamada, according to our Purána, practised fixed contemplation of the Supreme Being as a mode of divine worship, only after he had been expelled from the society of the Brahmans, and had become a Brahma Rákshas, and made the acquaintance of the Muni, who dwelt in the Pushpaka Vana (Flowery Forest). At that time neither Siva nor any of the Brahmanical gods or sages were acquainted with this mode of obtaining the favour of the divinity. This is evident from the narrative of Gritsamada's conversion, or apostacy, which is as follows: "Then a voice from heaven was heard, and Gritsamada became a demon[1]. The same Gritsamada then went to commence the practice of devotion[2]. As he wandered on he at last came to the forest, named the Flowery[3], filled with various trees and vines, and ornamented with clusters of flowers, adorned also with cascades of water, and the society of eminent sages. Gritsamada dwelt awhile with several venerable men, submitting to their commands. Then having bathed he performed *japa*, standing on the great toe with a fixed mind, contemplating the Supreme Lord, the god Vighneśvara, fixing his eyes on the point of his nose, yet seeing in all the ten directions, conquering his senses, restraining his breath, conquering the mind, and living on air. Thus for a thousand divine ages he performed severe *japa*[4]."

Such was the religion of Gritsamada, by which he obtained the favour of the Supreme Being and divine knowledge[5]. It was the same system that he taught Tripurásura, and by which that enemy of the gods obtained the supremacy over heaven and earth, and thrust down from heaven all the Brahmanical deities. Such also, according to the Mahávanso, was the system of Buddha, a system of spiritual and mystical contemplation of the all-pervading spirit.

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[1] अहि

[2] अनुष्ठानाय

[3] पुष्पकवनं

[4] Adhyáya 37. Sl. 1—5.

[5] ब्रह्मज्ञानं

Until Nárada visited the gods in their distress for the purpose of consoling and instructing them, they remained in entire ignorance of this spiritual and mystical system. On that occasion he addressed them as follows:—"I will relate to you concisely the greatly meritorious actions of the Daitya. He performed *tapa* for a thousand years, and obtained the favour of Gaṅeśa, the chief of the gods, and those irresistible blessings which carry dread to all others, and preserve him from all harm at the hands of Devas, Rishis, Pitris, Bhútas, Yakshas, Rákshas, Piśáchas and Nágas,—of all except the lord Sankara (Siva). Therefore, let all seek the favour of the chief of the gods, Gaṅeśa, with all respect, and let all worship him who obviates every difficulty, and bestows every needful blessing." The gods said: "O wise instructor, teach us how to worship that god of gods. Supereminent sage, mercifully tell us how to proceed." Nárada replies: "I will teach you all the one syllable *mantra* (Om). Repeating that *mantra* with a pious and fixed mind let all engage in meditating on the Supreme Being[1]. As far as I can see Gaṅeśa is the god to whom you must apply. He will deliver you all. There is no other remedy than this[2]."

In the same manner Nárada instructs Siva, who was formerly ignorant, in this worship of the supreme Gaṅeśa, as we have shown in the narrative. It was only then, according to this Purána, by the adoption of this new form of worship practised first by the Asurs, that Siva and the gods conquered their enemies and regained the supremacy which they had lost. While the Vedas, as we have seen, speak only of the worship of a multitude of gods, propitiated by sacrifices and libations, the Mahávanso introduces Buddha as remaining for many years in fixed contemplation of the divinity, and thus obtaining his favour, and afterwards proceeding to collect and instruct disciples exactly according to the plan adopted by the Asur, as described in this Purána.

4. The final state of bliss in which Tripurásura is said to have entered after death was unknown to the ancient system of the Bráhmans, but the idea has since been borrowed by them, and final emancipation made the chief reward of devotion.

The Sáma Veda concludes with the following prayer, which contains supplications only for temporal blessings,—the kind of good things which is chiefly dwelt upon in the Vedas. "Grant, O ye gods, who receive sacrifices, that we may hear only what is auspicious with our ears, and see only what is auspicious with our eyes; and may we who propitiate the gods arrive at the age fixed by the divinity, with undiminished mental and bodily vigour." The reward of the pious is on one occasion described as "reaching the world of the Sun[1];" on another, as "conquering the earth and ascending to the lofty mansions of the sky[2]," evidently Indra's heaven, the place appointed according to the Bhagavat Gíta for those who follow the rites prescribed by the Vedas. Tripurásura, on the contrary, according to this Puráńa, receives absorption into the divine essence as the reward of his devotion, just as Buddha received Nirván as the reward of his. This part of the Asur system, it is well known, has like the preceding been embodied by the Brahmans in the new Eclectic system of Hinduism which they have formed, and endeavoured to palm upon the world as the religion of their ancient *Rishis*. There is no doubt some slight shade of difference between the Mukti of the Brahmans, and the Nirván of the Buddhists, but they agree in the great and prevailing idea, that the liberated soul becomes united to the supreme spirit, and loses all traces of individuality.

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[1] अनुष्ठानं प्रकुर्वन्तु

[2] Adhyáya 40. Sl. 24—31.

5. Gritsamada is represented as practising celibacy, having neither wife nor progeny, and adopting as his son, to fill up the ranks of his order, Tripurásura, a wandering orphan, who presented himself before him. The accordance of such a state of things with the institutes of Buddhism, and its opposition to Brahmanism, is too obvious to require a single remark.

If now we consider that Gritsamada agreed in all these important points—in his notions of the object of adoration—the ceremonies of religion—the nature of divine worship—the reward of devotion, and the mode of filling up the ranks of the priesthood—with the Buddhists, while differing in them all from the ancient Brahmans, we shall have little difficulty in coming to the conclusion that the author of the Puráńa is here drawing a picture of the Buddhist sect, which, although sometimes degenerating into a caricature, represents nevertheless the general features of Buddhism, with sufficient distinctness to make them easily recognised.

One remark more yet remains to be made, and it is one of no small importance in the history of religious opinions in India; it is that Gritsamada when he left the Brahmanical sages found other Munis with whom he resided, and whose commands he for a season obeyed, though it is not said that he adopted their entire system. So Buddha in the Mahavanso is said to have met with *doctors of reason,* whose ideas of religion were similar to his own, though not in all points identical. Buddha gave a great impulse to the system of the ancient Munis, and new modelled it, so as to make it pass for one of his own invention among foreigners; and this is exactly the light in which Gritsamada and Tripurásura are exhibited in relation to the Munis of Pushpaka Vana.

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[1] P. II. Adhyáya VII. 4.

[2] P. I. Prapathaka I. Daśati 10. 2.

The legend of Devántaka and Narántaka, with which the second part of the Purána commences, is so similar to that of Gritsamada and Tripurásura in their performance of *Anushthán,* their victory over Indra, and devotion to the supreme Ganeśa, that it does not seem to require any separate remark; though it furnishes additional proof of the oneness of Buddhism and the Asur system, and leads to the same conclusion as that at which we have arrived from the consideration of the former part of the work.

Art. XVII.—*The Ante-Brahmanical Religion of the Hindus.*
By the Rev. Dr. Stevenson.

[*Read March* 15, 1845.]

It is a matter of no small difficulty to give a general view of the Religion of India, and so to arrange the different Deities composing the Hindu Pantheon, as to place before the student of Hindu Mythology a connected and harmonious system of the religious belief of the natives of Hindustan. Brahmá for example is styled the Creator of the Universe, and yet almost totally disregarded, not even a single temple being erected to his honour, although creation is one of the chief grounds of religious worship. Vishnu in the system stands forth as the Preserver, but in the eye of his votaries consisting of myriads in every part of the country, the world owes its origin, as well as its preservation to him; and Siva, though systematic writers tell us he is to be regarded as the author of Destruction, and the third God of the Hindu Triad, is worshipped by millions as the Supreme God, the Preserver as well as the Destroyer, the Imparter equally with the Taker away of life. Again, no small proportion of the Hindu nation ascribe the origin of the system of the Universe to a female divinity, whom they consider the Mother of all the Gods, and to whom also they attribute a principal share in its government. In regard to the rites and ceremonies by which the objects of their veneration should be served, there is an equal diversity of sentiment among the Hindus. Some think it wrong to offer to a deity any thing that has ever been possessed of life, while, on the other hand, others hold by the maxim that without shedding of blood there is no remission of sin, or reconciliation with God. To endeavour then, as some both among Hindus and Europeans have attempted, to combine all these contradictory positions into one harmonious system, can never gain the approbation of the rational inquirer. The present Hindu religion must be considered not as one system, but as a congeries of parts derived from several systems, and we may as soon look for order and consistency in it, as in the iceberg where trees carried down by the mountain torrents, polar bears which had gone out to sea in search of their prey, and the amphibious seal, had all been hemmed in by the irresistible power of congelation, and united with the frozen liquid in the formation of one heterogeneous mass.

It is necessary, therefore, that we should remember that there are three different systems of religious belief which have contributed to the formation of modern Hinduism. The System of the ancient Brahmans, the Buddhistical System, and the rude idolatrous worship which, previous to the extensive propagation of either of the above Systems, prevailed among the Aboriginal inhabitants of India, in order that we may have a true and exact notion of what is now called the Hindu religion. From the Brahmanical system, as developed in the Sanhitás and Bráhmanas of the Vedas, we have among the Brahmans, the daily and periodical readings of the Vedas, the preservation of the sacred fire, and its accompanying worship, and the adoration of Vishnu as a deity of great power and influence. From the Buddhistical system is derived the tenderness of animal life, a thing foreign to the Vedas, in which hymns are appointed to be sung even at the sacrifice of the Sacred Cow. Hinduism owes, if not the invention of the principles of its metaphysics, at least much assistance in their development and culture, to Buddhism. The great principles in all the ancient systems are the same;—the importance ascribed to Swabháva or Nature, the Metempsychosis, and Final Absorption,—these are common to Buddhism and Brahmanism, notwithstanding their respective peculiarities; and the disputes of the respective adherents of the two systems have tended to bring them farther into greater prominence. The worship of Jagannatha in Orissa, and of Vithoba at Pundherpur, where the distinction of caste is laid aside for the time, are both derived, as I have elsewhere shown, from a Buddhistical source. But the modern system of Hinduism seems after all to have been mainly addebted to local superstitions, prevalent among the aboriginal tribes, which I have called the Ante-Brahmanical religion of the Hindus in former papers.

Under this head I think we must class the worship of Siva, especially under the form of the Linga, which now so extensively prevails among the Hindus. Siva is usually styled Iśvara or Supreme God, Maháleva or Great God, or distinguished by some other name indicating pre-eminence. As Siva has in modern times been patronized by a great proportion of the Brahmans, and been celebrated in a majority of the Puránas, it may seem rather hardy to assert that he has no place in the original Brahmanical Theogony, and is no better than an upstart, introduced into the system from the rude and unconnected superstitions of the Barbarians, among whom the Brahmans introduced civilization and literature. The following considerations however will, I think, convince every impartial person, capable of forming an opinion on the subject, that this is really the case.

The notion of a triad of Gods, of which in the modern system

Siva forms one essential element, is altogether unauthorized by the ancient Hymns of the Rig and Sáma Vedas, the only undoubted composition of the ancient Rishis, and unimpeachable authorities in regard to the opinions of the ancient Brahmans. I do not insist upon Brahmá, Vishnu, and Siva never there being found united by name as emanating from the primeval Divinity, but on the fact that no three gods are there represented as flowing immediately from Deity. Such a triad, indeed, forms a part of the Egyptian Theogony, where Osiris, Isis, and Horus, or perhaps more correctly Amoun-ra, Amoun-neu, and Sevek-ra form a triad of gods. The Buddhists, too, have a triad, the Chinese also have one, and even the Greeks and Romans had their Jupiter, Neptune, and Pluto, sons of Saturn, among whom the government of the world was divided. But on looking into the Vedas we find Agni, Váyu, Indra, Mitra, and Soma, the deified Fire, Wind, Firmament, Sun, and Moon, all frequently highly extolled, but never arranged in a Triad System. The only thing of the kind that appears in the Vedas, and which may not improbably be a remnant of a doctrine, which seems to have existed in very ancient times, and with more or less corruption to have been embodied in the religions of the most ancient nations of the world, is the three sacrificial fires, which are necessary for the performance of the most sacred Brahmanical rites. In the Somayága and Jyotishtoma for example, three fires, Dakshinágni, Ahavaníya, Gárhapatya, one at each end, and one in the centre, joined by a serpentine line, are lighted up for the performance of the sacrifice. It is the same god Agni, however, under different aspects that is supposed to reside in them all; in one, as the vivifying heat that supports the world, and which resides chiefly in the southern regions; in another, as the sacred flame that licks up the sacrifice, and forwards it to the gods; and, in the third, as that guardian fire which ever burns in the house, and cherishes the family of the sacrificer. This was the Trinity of the ancient Brahmans, and not a triad of gods derived from one Great Spirit, exercising various functions in the production and administration of the affairs of the universe,—the form that it has been made to assume in the modern system. The presumption then that lies in favour of the existence of Siva in the ancient system of the Brahmans, as one of that triad, of which one is the Creator, another the Preserver, a third the Destroyer, is entirely obviated, as this forms no part of the ancient Brahmanical system.

Farther, Siva is not named at all in the ancient Hymns of the Veda, and therefore we have no evidence that such a deity was worshipped by the ancient Brahmans, but on the contrary, since all the gods are invited to partake of their sacrifice, and all of any notoriety separately and frequently called on by name, it could never have happened that so great a god as Mahádeva could have been overlooked, if he had been known to the Brahmans. I know that it will at once be objected to this statement, that Siva is the Rudra of the Vedas, and therefore frequently invoked under that name. The first time that the word Rudra occurs in the Vedas, is in the 10th Rich of the IV. Sukta of the VI. Anuvaka of the First Book of the Rik. The third and fourth Suktas are an address made by Súnah Sepa to Agni.

In every one of the twenty-three verses of which they consist, Agni is directly addressed except in the 4th Rich of the IIIrd Sukta, where Varúna, Mitra, and Aryama, three of the Ádityas, are invoked. In the Rich preceding the 10th, and in the one that follows Agni is specifically invoked, and the Commentator Sáyana Achárya, without any hesitation applies the 10th also to the same divinity, paraphrasing वोध by वोध्यमानाग्ने and translating रुद्राय by क्रूराय, making it an epithet of Agni. The same verse is again introduced into the second Daśata of the 1st Part of the Sáma Veda at the 5th Rich, in a collection of verses in praise of Agni; showing that Vyása, or whoever arranged these verses, here considered the two as identical. And in the IXth Prapathaka, Rich 3, of the IInd Part, Agni is again identified with Rudra in a way that cannot be be mistaken. After quoting the same verse, there is immediately added, "May he, the Mighty One who cannot be measured, *known by his smoky ensign*, the all-joyous divinity, satisfy our desires in respect to solemn rites, and supplies of food." Yet, although Rudra in those instances must be held as identified with Agni, Agni cannot be identified with the Siva of the Puranas. Siva is better known by no characteristic than by his having five heads, and hence called Pancháнana, as Brahmá is by his having four; and Agni is as distinctly characterised by his having seven heads, and hence has acquired the name of Sapta Sírsha. Here are besides several passages in the Vedas where Rudra cannot well be identified with Agni, and the Rudras are generally regarded as a subordinate class of divinities; thus for example, Agni is on one occasion called on "to bring Indra with the Vasus, Brahat with the Ádityas, and Rudra with the Rudras" to the sacrifice, which could not be said, if Rudra and Agni were the same deity. (Rik. Ashtaka V. Varga 13.) Indeed, we are forced to acknowledge that most of the Rishis followed a different legend from that adopted by Súnah Sépa in the above mentioned passage,—a legend adopted by the Vishnu and Matsya Puránas, which make the production of Rudra or Vámadeva, the leader of the band, to spring from Brahmá, after his mental sons. None of the Rishis seem even to have dreamt of elevating Rudra to the highest place in the system, either as the underived essence, or as one of a triad, the cause of destruction and regeneration. The above-quoted Rich will equally prove that Rudra cannot be one of the Ádityas.

The place that Siva now occupies in the Saiva System, and Vishnu in the Vaishnava, was held in ancient times by Soma. In the Vedas, Soma the deified Moon, identified with the spirit drawn from the Moon-plant, is the principal deity. It is said that "he holds the first place among the gods" (Sáma Part II., Adhyáya III., Varga 1); "that he is the Creator of all things that have been, or shall be, who raised the Sun to his station in the heaven" (Part II., Adhya. XII., V. 19); "that he made the four luminous worlds and their appendages" (Part I., Daś. 7, V. 7); "that he is the father of intelligence, the father of heaven, the father of fire, the father of the sun, and the father even of Vishnu" (Part I., Daś. 4, V. 5); and he is said moreover to be "the Mighty Essence, which remained when the womb of Ocean covered up all the gods, who [placed in Indra all the might that deity possesses, and produced the solar radiance" (Part I., Daś. 1, V. 10). On the other hand, the Rudras in the Veda are joined with the Ribhus, deified Brahmans, in singing the praises of Indra (Part II., Adhyáya 16, V. 1). For Indra is a divinity notwithstanding the contempt into which he has now fallen, sustaining in the Veda the character Vishnu holds in the modern system of the Vaishnavas, being called "the Sun of the world and Lord of all things animate and inanimate" (Part I., Daś. 5, V. 1); "who, when all the gods fled before Vritrásur, alone, with his dependants the Maruts, subdued the hosts of the enemy" (Part I., Daś. 4, V. 2). How very different the rank attributed to Rudra is, and how clearly he is identified with Siva in the Linga Purána, the composition of one of his sectaries, appears from every page.

The following lines from the exordium may be quoted as illustrative of this position, and of the nature of the modern Hindu Triad:—"The ungenerated is Siva, and the Linga is denominated Saiva (belonging to Siva); when we speak of Pradhána and Prakriti (Chaos and Nature), we are also to understand the Supreme Linga, which is free of smell, colour, and taste; which can neither utter a sound, nor be made the subject of touch; having no sensible qualities, but stable, undecaying, ungenerated. The qualities of the manifested Siva, the most excellent Linga, are, on the other hand, smell, colour, taste, a capability of uttering sound and of being touched. He is the womb of the world, the principal element, sometimes vast, sometimes minute. The Linga itself, for the purpose of developing the world, was produced from the ungenerated; and from social affection the one Linga expanded itself into seven, into eight, and into eleven. From these came the blessed Triad, the first principle of the gods, springing from one, subsisting in three; the whole guarded by one, and the whole unity also carried forward and manifested by one, namely, by Siva." . . . . "Rudra the Supreme Spirit, the Revered, the Creator (Brahmá), the eternal, the all-wise, and he who is from his nature free from all fault, is called Siva in the Purănas."

It may here be important to refer to the Legend of Daksha, as given in the eighth chapter of the Vishnu Purána, and the extract appended from the Váyu Purána, in Professor Wilson's translation. From that legend it is evident, that Daksha considered that he had all the Rudras present with him, though he had not invited Siva; and that none of the ancient Munis, except Dadhícha, looked on Siva as possessing any right to a share in the sacrifice; that Siva himself confessed to his wife, that "it was a contrivance of the gods that in all sacrifices no portion should be assigned to him;" and that, moreover, his sacred rites were not performed after the Brahmanical method. "My priests," says he, "worship me in the sacrifice of true wisdom, where no *officiating Brahman is needed;*" and, lastly, that at the conclusion, when Daksha submitted to Siva, he received the desired fruit of his works, not from Brahmanical ceremonies, but from adopting the Yoga of Siva. We could hardly, I think, expect plainer language from a Hindu author, in describing a complete change of religion, and the substitution of the new rites of Siva for the ancient Brahmanical worship.

If it be impossible to identify Siva with any of the gods of the Veda, much less is it possible to trace any connection between the symbol of the Linga, under which he is usually adored, and any of the ancient Brahmanical emblems. It is manifest from every page of the Sáma and Rig Vedas, that Agni was adored under the element of fire, that Mitra had no emblem but the sun which shines in the firmament, and that Váyu's presence was only known by hearing his voice resound through the sacrificial hall. The genius of the pestle and mortar are indeed addressed as well as the genius of the waters; but no image in any human or bestial form appears ever to have been made, except when the genius of the oblation was addressed,—the barley meal of which it was composed being formed into the shape of something like a human head. (Sáma, Part II., Adh. 16 and 17.) But with this doubtful exception, no image was introduced into the Jyotishtoma, Somayága, or other sacred Brahmanical rites authorised by the Vedas. Polytheistical the worship undoubtedly is, but not idolatrous in the proper and distinctive sense of that term. All the worshippers of the Linga, even those Lingáyats who may be said to be monotheists, pay religious homage to the emblem of the god whom they worship. It would be much easier to trace a connection with the worship of the Phallus, which Clemens of Alexandria informs us was set up in every Grecian city to Dionysus or Bacchus, said also to have been considered by some the same god as Osiris, one of the Egyptian Triad, more especially as Arrian the historian seriously relates, that Dionysus made an expedition into India. I speak not of the Priapus of the Romans, the Baal-peor of the Moabites, and some left-handed objects of worship among the Egyptians, for these are not to be identified in any way with Siva. And even in regard to Dionysus, I do not argue that there is anything more than a nearer resemblance than exists between the Linga and any Brahmanical emblem of the Deity.

There is an obscure intimation in the Linga Purána itself, that the worship of the Linga was only introduced at a late period. It is the famous passage from the fifteenth Adhyáya, where the fiery Linga is introduced as settling the dispute between Brahmá and Vishnu for superiority, by taking to itself the honour which they respectively claim. Brahmá and Vishnu seem to have occupied the field between them, till Siva came in to set aside the claims of both. Might we venture to interpret the allegory, and say, that when the ancient Brahmans and Buddhists (for Buddha is considered as an incarnation of Vishnu) were contending for superiority, the votaries of the popular superstition connected with Siva and the Linga, with a few men (probably Brahmans by birth) of learning and influence on their side, wrested the prize from the hands of both, and assumed it to themselves, modifying the ancient faith of the Brahmans, and embodying the popular superstitions, so as to form the Saiva system of Hinduism.

The introduction of Siva, then, into the number of the objects of Brahmanical worship seems evidently an innovation, from the account of Daksha's sacrifice in the Váyu Purána, no sage but Dadhícha having taken the side of 'Siva; and he seems to have been a kind of heretic, since according to the Linga Purána he was the especial object of Vishnu's displeasure, and only saved from his fury by his devotion to Mahádeva; and in the Sáma Veda (Part II., Adh. V., R. 8), this Rishi is represented as having had a horse's head, the bones of which Indra employed as weapons against his enemies.

Our conclusion from these authorities in reference to the worship of Siva, is strengthened by the fact, that the sacred places considered as the peculiar residence of Jyoti-Lingas, are generally in the south and north-east of India, at a great distance from the original Brahmanical Settlements to the north of the Ganges and west of the Sarasvati, none being nearer than Mount Abu in Gujarat; and that the south of India is almost the only place where the sect of the Lingáyats abounds; and that in the south and east of India the worshippers of Siva and his incarnations, are far more numerous than those of Vishnu, while in the north-west the contrary is the case.

That the Linga is not originally a Brahmanical object of worship, seems to me very evident by a fact that I have not seen noticed, but which as far as the Maráthi country, where Sáivas greatly prevail, is concerned, I can vouch for from an extensive observation: it is, that no Brahman officiates in a Linga temple. The Brahmans alone officiate as image dressers in the temples of Vishnu, and of all the gods connected with the ancient Brahmanical worship; but for the temples of the Linga, a distinct order of men originally of Sudra origin, have been set apart, and form now a separate caste under the name Guravá गुरवा. The Guravá dresses the image and takes care of the temple; and all that the Brahman or any other worshipper does, is to present before the image his offering of dry rice, plantains, flowers, turmeric, &c., not interfering with the Guravá's dispositions or touching the image. It is quite contrary, however, when a Brahman worshipper comes to Vishnu; he displaces the drooping flowers if he pleases, and places on the image fresh ones with sandal wood paste,—a liberty he may not take with Mahádeva. This difference I consider a proof of the imperfect amalgamisation of the worship of the Linga with Brahmanism, since no other reason can easily be assigned for such a marked difference, and such a distance between Siva and his worshippers. The Yogis, devotees of Siva, who may be supposed as adhering more strictly than others to the original ceremonies of his worship, as if in evident contrast to the Brahmans, and mockery of their frequent ablutions, cover themselves with ashes instead of purifying the body by bathing, as every Brahman must do before he can partake of a regular meal. Siva is represented as sitting like a Yogi in the place where the dead are burnt, the most impure of impure places to a

Brahman; just like the devil Maha Sohon of the Ceylonese Demonology. (Callaway's Yakkan Nattannawa, verse 58—63.) Like him, too, Siva rides on a bullock, a mode of conveyance still deemed disreputable among the Brahmanical population of the Dakhin, though used often by the common people. This demon has a moon on his thigh, Siva has one on his forehead; Siva's ornaments are snakes, the Ceylonese demon has one round his neck. "According to the preached doctrine of Buddha, there is not a devil his equal in the world." (Y. N., 50.) Siva is called भूतेश Bhútesa, or prince of devils; strong analogies these with the local superstitions of Ceylon, similar to which others prevail in the south of India, while there is not a trace of analogy in any of these points to the genuine doctrines of the Brahmans as contained in the Vedas.

From all these considerations, I think it as plain as such a subject can be made, that the worship of Siva is nothing more than a superstition of the aboriginal Indians, modified by the Brahmans, and adopted into their system for the sake of gaining an influence among the tribes who were previously addicted to its practice.

If it be asked, what local deity Siva represents, and what was his ancient name, I would state as a probable conjecture that केदार Kedár, was the original Hindu name of Siva. It is true the word Kedár has been adopted into the Sanskrit language, but its derivation from any Sanskrit root is quite fanciful; and it may have been originally a Hindu word, signifying a mountain, and applied to the deity in question as the mountain god. The symbol of the Linga may have suggested itself, from the rounded peaks with which the Himálaya, the Sahyádri, and other Indian chains abound. Kedár is the name of a Himálayan Peak, and also of the highest peak on the Purandhar Hills in the vicinity of Puna, on which a temple to Siva, under the name of Kedár, is built. Similar temples are also built in other places on similar eminences. Supposing it objected that Párvatí, the wife of Siva, is said to be daughter of Hima, the genius of the Himalayan Mountains, with which Kedár is thus virtually identified, and that she cannot be both the daughter and the wife of the same divinity; it may be answered, that this, so far from being an objection to the theory, is a confirmation of it; for not only in the Matsya Puráua is Satarupá declared to have sprung from the body of Brahmá and to have become his wife, but Siva is represented in the Linga Purána as being at first an Ardhanárísvara, half male and half female, and is so sculptured in the great Elephanta Cave. When the separation took place, the separated male and female were Siva and

Párvatí, so that after that event, the former stands to the latter in the double relation of father and husband. Let it be observed, that I propose this merely as a probable theory, which, whether received or rejected, will not materially affect the main object of this paper founded on passages of the sacred writings of the Hindus, relative to the original character of Siva, and the nature of his worship, as proved to have had no place in the original Brahmanical system.

Art. XVIII.—*Memorandum on certain Fossils, more particularly a new Ruminant found at the Island of Perim, in the Gulf of Cambay. By* Albemarle Bettington, Esq., *of the Bombay Civil Service*, F.G.S., M.R.A.S.

[*Read 7th June*, 1845.]

The fact that fossils are found at Perim has been noticed by Baron Hugel, Captain Fulljames, and others.

In a paper published in the Journal of the Asiatic Society of Bengal, May, 1836, Captain Fulljames, who has obtained certain of these fossils, has accurately described the general appearance of the island, and the matrix in which the greater portion of the fossils are found, viz., a conglomerate of sandstone, clay, and silex. In addition to what has been written on the subject, I would observe, that the appearance of the island at the ebb of spring tides is extraordinary; and accounts for, if it will not countenance, the legend, that Perim was formerly connected with the main.

The shore shelves very gradually; and at the lowest ebb, the island appears (I speak particularly of the west side,) only separated as it were by a river from Katiwar. This is the gulf stream which sets on both sides of the Island of Perim; the channel on the Katiwar side is stated by Captain Fulljames to be seventy-five fathoms in depth, and five hundred yards in width; that between Perim and the coast of Broach is, I apprehend, greater; elsewhere the depth of the gulf about Perim and to the north, averages below fifty-five fathoms.

In relation to the present question, I would add that a vast quantity of alluvium is held in deposit, and brought down in the waters of the rivers Mhye, Sabermutty, Nerbuddah, and Taptee. In the floods, which are at the present day of frequent occurrence, large trees, and the bodies of oxen, deer, bears, and other animals, are carried down these rivers in the freshes, and so into the gulf. As regards the Mhye, the Sabermutty, and the Nerbuddah, more particularly, I wish to shew that the causes are still in operation, which would make the small Island of Perim, with its shelving shore; it being a first obstruction, and the point at which the gulf stream diverges;—I would submit that it would necessarily become the receptacle for the bones of animals carried down by the rivers in the great land floods of past ages. Though some of the bones are preserved in a manner truly astonishing, others are rolled and broken so as to defy recognition.

It is thus, as I have attempted to shew, we may account for finding at Perim the heterogeneous collection of bones of various ruminants and pachydermata; some of animals of familiar and still existing genera, others of strange and monstrous character hitherto unclassed among fossil organic remains; the whole mixed with saurians, of which in like manner some of the co-geners are still common in the Indian rivers, and others are new, and as yet unclassed; and it is to the powerful action of the gulf stream as it sets at present,—in one direction forming new, at others removing older deposits,—that the bed which contained the chief part of the fossils I have obtained has become exposed. This bed, I should remark, is below the ordinary low water mark, and only accessible at the ebb of the highest spring tides.

I had a party employed for more than twelve months; whenever the state of the tide would admit, they went down and disengaged such masses of rock as shewed any indications of bone attached,—these were brought away in a boat from time to time.

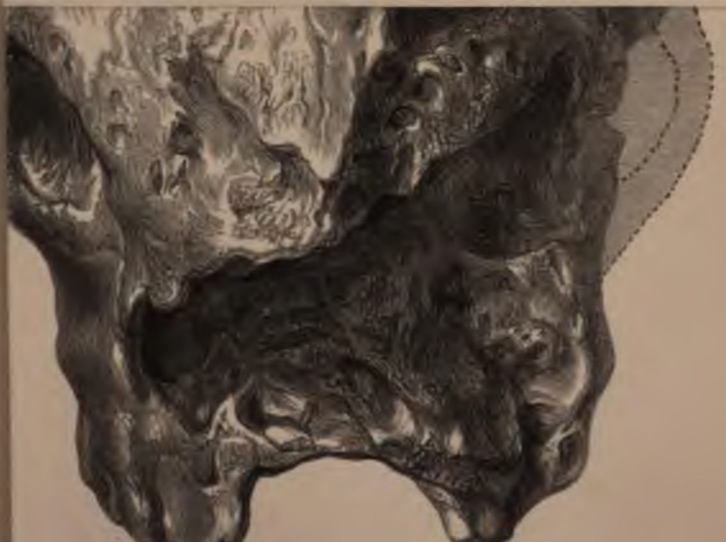
A large quantity, chiefly bones of mastodon, I left in India; but brought to England four chests, containing the more curious and portable specimens I had the fortune to collect, some of which are now submitted for inspection. The most deserving of notice is the skull of a large animal, which I believe is now fully established and admitted as the first of a new genus as yet un-named. The mass of conglomerate which contained it weighed altogether 170 pounds; it was brought from Perim with some other specimens by my superintendent of boats, Mr. Ryan, from whom I obtained it; the labour of freeing the skull from nearly one hundred pounds weight of matrix occupied me many weeks; when cleared, as it now appears, from all superfluous matter, I shewed it in India to the late Dr. Malcolmson, who pronounced it to be great value. He and others were disposed to think it a Sivatherium, but this opinion has been overruled. The anomalous characteristics it presents I will presently attempt to point out.

The greater portion of the occiput, and of the dexter side of the head, are well preserved; on this side also, the maxillaries, and the alveoli of the molars, with the exception of the first, are quite perfect. The outer surfaces of the teeth are slightly injured; but the interior, and the grinding surfaces, are in great preservation; on the *left* side, the injury to the fossil from the action of water is considerable; but he tuberosity of the maxillaries is still preserved, with the alveoli of the six molars; but the teeth themselves, though well preserved on the palatial side, are on the exterior much injured.

Whether it arises from the uneven and irregular line presented by the apparent grinding edge of the molars on the left being different from that on the right side, the eye is certainly struck with an irregularity in the outline of the base of the head. More than one person has supposed that this part of the head has received injury and become distorted; violence to such extent, however, involving the forcing in the lower maxillaries, and the alveoli of the six molars, would shew itself elsewhere, and the palatial surface in close proximity might be expected to shew a fractured line; whether this would necessarily be the case or not, I am not competent to say, but I can observe no signs of injury to the palate, and surmise that the contorted and irregular appearance arises from the destruction of the outer surface of the left molars. I should observe, that the muzzle being more truncated on one side than the other, adds to the irregularity of the outline, which diminishes to the eye, if the injured molars be covered, and allowance be made for the deficiency in the muzzle on the opposite side.

With marked and important deviations, it still bears greater affinity to the Sivatherium than to any hitherto discovered fossil. I have availed myself of the detailed measurements, given in the well-known paper by Captain Cautley and Dr. Falconer, (published in the Asiatic Researches of 1837,) to assist me in an attempt to give a comparative measurement of the new fossil. If the measurement shall prove useful it will be due to the guidance thus obtained.

Captain Cautley and Dr. Falconer compared the Sivatherium with the elephant and the rhinoceros. It was considered by certain of the French geologists, that the Sivatherium presented points of affinity to the giraffe; this, however, has been disputed, but the skull of the Perim fossil, however widely differing in other respects, has peculiarities of formation, still more than the Sivatherium, allied to the giraffe, particularly a very remarkable contraction of the frontal bone above the orbits, in which respect it varies widely from the Sivatherium, which exhibits on the contrary a widely expanded frontal like an elephant. For the satisfaction of those who wish to examine the several points of difference and those of affinity, I have compared the three, viz., the Perim fossil, the Sivatherium, and the skull of an adult giraffe now in the British Museum. As I have but little experience in such matters, these measurements must be received accordingly; I was occupied several days upon this work, measuring and remeasuring, and took every care in my power to make them true.



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I imagine them to be substantially so, still they must be taken subject to correction.

Comparative measurement of the skull of the Perim Fossil[1], *that of the Sivatherium, and the skull of an adult Giraffe.*

	FOSSILS.		Giraffe.
	Perim.	Sivatherium.	
From the anterior margin of the foramen magnum to the alveolus of the first molar . . .	17·375	18·85	14·125
From ditto to the truncated extremity of the muzzle	17·5	20·6	24·625[2]
From ditto to the posterior margin of the last molar	9·75	10·3	9·
From the tip of the nasals to the upper fractured margin of the cranium	16·625	18·	21·
From ditto ditto to ditto along the curve . .	17·375	19·	21·5
From the anterior angle of right orbit to the first molar	7·625	9·9	6·375
From the posterior to the fractured margin of the cranium	10·5	12·1	8·[3]
Width of cranium at the vertex, mutilated at left side . . . . . (restored, about)	11·	22·	9·
Ditto between the orbits, upper borders . .	4·25 : 8·5	12·2	11·375
Ditto ditto lower borders	7·25 : 14·5	16·2	8·
Ditto behind the orbits at the contraction of the frontal . . . . (about)	8·5	14·6	8·375
Ditto between the middle of the zygomatic arches	. .	16·4	8·
Ditto between the bodies of the malar bones .	. .	16·62	7·
Ditto base of skull behind the mastoid processes, mutilated on both sides . . . . ; .	12·	19·5	6·25
Ditto between the cheek tuberosities of the maxillaries	5·5 : 11	12·2	6·75
Ditto of muzzle portion of the maxillaries in front of the first molar . . . . . (about)	3·5	5·8	4·625
Depth from the convexity of the occipital condyles to middle of frontal behind the horns (fractured, about)	10·625	11·9	10·125
Ditto from the body of the sphænoidal to ditto between the horns	. .	9·94	. .
Ditto ditto to frontal at the anterior base of the horn	9·125	. .	. .
Ditto from middle of the palate between the third and fourth molars to ditto at root of the nasals . . . . (truncated, about)	2·375	7·52	7·5

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[1] Certain comparative measurements are impossible, by reason of the part referred to in the Sivatherium being either mutilated, or altogether non-existent, in the Perim fossil; for example, referring to the nasal arch, which has no existence in the Perim fossil, or the distance between the anterior horns, the base in the Perim fossil being confluent, and the summit on one side mutilated.

[2] Muzzle unmutilated.

[3] Margin unfractured.

	FOSSILS.		Giraffe.
	Perim.	Sivatherium.	
Depth from posterior surface, last molar, to extremity of nasals . . . (truncated)	8·375	13·0	16·
Ditto from grinding surface, penultimate molar, to root of nasals . . . . (about)	9·	10·3	9·625
Ditto from the convexity near the tip of the nasals to the palatial surface in front of the first molar	. .	5·53	10·875
Ditto from base of nasal to palatial surface in front of second molar[1]	4·875	. .	. .
Ditto from middle of the ala of the occipital to the swell at vertex of frontal . . .	5·125	8·98	. .
Ditto from inferior margin of the orbit to grinding surface, fifth molar	5·625	7·3	4·625
Ditto from the grinding surface, first molar, to edge of the palate in front of it . . .	. .	2·6	0·875
Ditto ditto second molar, first being partly destroyed[2]	1·5	. .	. .
Space from the anterior angle of the orbit to tip of the nasals . . . . . (mutilated)	4·625	10·2	15·75
Antero-posterior diameter, left orbit . . .	3·875	3·3	3·5
Vertical ditto	2·75	2·7	2·625
Antero-posterior diameter of the foramen magnum	2·125	2·3	1·625
Tranverse ditto	1·625	2·6	2·25
Long diameter of each condyle	3·625	4·4	2·5
Short or transverse ditto of ditto	1·875	2·4	1·375
Interval between the external angles of ditto measured across the foramen	5·25	7·4	4·625

Examining the result of the comparison, some of the points most worthy of notice appear to be:—

That each being an adult of its kind, the Perim fossil was the smaller animal. From its character and power it could have been little likely to disturbance or attack from other animals, and the line of vision is lateral and anterior, but not retrospect. The orbit in the Perim fossil appears to be more prominent, placed more forward in the head than in the Sivatherium, and the osseous margin more strongly developed.

That the width of cranium at the vertex in the Sivatherium, was in the proportion of 2 to 1 above the Perim fossil. Considering the relative positions, the head of the Perim fossil was at every point of measurement more compressed in width than that of the Sivatherium. At the base of the skull behind the mastoid processes, the Sivatherium is in excess as 19·5 to 12. A straight line drawn down from the anterior angle right orbit of the Sivatherium falls 1·125 inch behind the root of the sixth molar, the same line in the Perim fossil falls through the base of the fifth molar, or 1·875 inch more forward. Length of upper jaw measured outside from posterior margin of sixth to anterior margin of first molar in the Perim fossil is about 8·625, in the Sivatherium 10·125. The shape of the occipital condyles varies slightly; the condyles of the Perim fossil being rather more elongated transversely, with less antero-posterior depth.

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[1] In lieu of the last measurement, which cannot be taken.

[2] *Vide* note as above.

In the Sivatherium it appears to me, that the occipital and parietal bones projected laterally, so that the zygomatic arch was, if I may so express it, covered or overshadowed. In the Perim fossil on the contrary, the zygomatic arch was projected much more beyond the vertical line of the skull. The zygomatic arch and malar bones are wanting, but there is enough of the zygomatic process on the right side, to mark its site and character.

I may here observe, that nearly the whole of the occiput is in beautiful preservation; and the mastoid process on the left side is quite perfect. All the parts along the base of the skull, from the first molar to the occipital condyles, are very perfect. The zygomatic fossæ are deep and well defined.

The condition of the teeth, in the opinion of competent judges, proves the animal to have been an adult. The manner in which the teeth are set in the head is worthy of notice: they are inclined upwards, so that the grinding surface of the first is at an angle with the last molars and with the base of the head, presenting altogether the same appearance as the teeth of the Sivatherium, described by Dr. Falconer; the teeth in number, form, and character, are similar to those of the Sivatherium; a comparison of the two shows the Perim fossil to be somewhat smaller, but perhaps not less than the proportion in the relative size of the two heads.

I will here only remark, that the teeth bear close affinity to those of the Sivatherium, an elaborate and detailed account of which is given in the paper by Captain Cautley and Dr. Falconer, before referred to, in the Bengal Transactions. The subject is of great difficulty, and one on which I am not competent to enter.

As to the remarkable contraction referred to, in the frontal bone of the Perim fossil, in measurement with the Sivatherium and Giraffe, I find the former to be 8·5, the Sivatherium 14·6, the Giraffe 8·375.

Another marked distinction between the Perim fossil and the Sivatherium, is in the immense difference in the width of the cranium at the vertex. The mutilation on the left side restored in the Sivatherium gives, according to Dr. Falconer, the full width about twenty-two inches. In the Perim fossil, measuring the perfect half, from the suture of the parietals to the extremity of the transverse ridge of the occiput, (augmented it should be observed by the base of the posterior horn,) and doubling this measure, to supply the half for the side now mutilated, eleven or eleven inches and a half is the maximum attainable. So that here the Sivatherium is in excess above the Perim fossil in the proportion of two to one; in fact, at this view, no two skulls of animals of the same order can be more dissimilar; and the Perim fossil (saving always the horn) approaches nearer the character of the Giraffe.

The greatest point of difference between the two fossils is the formation and relative position of the horns. In the Sivatherium the anterior horns may perhaps be considered to bear the same relation in point of size to the gigantic posterior horns as do the anterior and posterior horns respectively of the four-horned antelope. The Perim fossil presents a remarkable anomaly; the anterior horns rise from *a confluent base* from the temporals, and covering the vertex, the base measuring twenty-five inches; the horn measured, above the line of division, eighteen inches. This formation I apprehend is without precedent in the animal kingdom fossil or recent.

An extension and prolongation of the transverse ridge of the occiput forms a protuberance, extending, at its lower edge, to the zygomatic process; its general character, cancellar structure, and extent of development, bar the supposition that it was a process for the attachment of muscles, and compel the conviction that this was a posterior horn. It shews a strong and rapid convergement of its sides to a point, indicating that its length was inconsiderable as compared with its massive base; these horns were "reflected" much in the same degree as those of the common Indian buffalo; the appearance of the animal, according to our ideas of the existing order of things, must have been truly monstrous.

The transverse ridges of the occiput are strongly defined, ending, as has been already stated, in reflected horns. The fossa for the attachment of the exterior muscles of the head is of great depth and expanse, and indicative of great power; there is great elevation of the occipital. I observe this formation referred to in Professor Grant's work in regard to the rhinoceros, as indicative of great force and power; it is applicable to the present case where great muscular power must have been needed, to give effect to a weapon of the size of the gigantic anterior horns. As the weight of this animal's head must have been greatly in excess of that of any rhinoceros, perhaps it may be inferred, that the cervical vertebræ were proportionably shorter; if this be admitted, it carries with it also the probability that the animal was furnished with a prehensile upper lip, or perhaps a tapir-like proboscis; though in regard to the latter supposition, I certainly can trace no manifest point of resemblance to the tapir skulls as delineated in Cuvier, "des Ossemens," tome 2nde.

From the general contour and perceptible rounding of the muzzle, which the skull is sufficiently perfect on both sides yet to shew, more particularly on the left side over the alveoli of the second, and part of the first molar, there is reason afforded to doubt if there was any considerable extension of the intermaxillary bones. The outline and slope also of what remains of the supermaxillaries and nasal bones, do not appear to indicate the existence of an arched nasal, of the character found in the Sivatherium and rhinoceros.

Besides this ruminant of a new genus, some of the fossils I obtained from Perim are, I believe, considered identical in character with others which have been found in the Sivalic Hills, others are as yet proper to Perim; among the latter, a new crocodilean of great size. I had some bones which, from their coarse and fibrous structure, were supposed by the late Dr. Malcolmson to have been those of Cetacea. I was under the impression that I had brought some of them to England, but I cannot find them in the collection.

There are also several specimens of Mastodon angustidens, and Mastodon latidens; among others some of that description designated by Captain Cautley and Dr. Falconer "Sivalensis," but which now proves to have been common to Western India. There is part of the molar of true elephas, parts of tusks of mastodon, skull and teeth of young mastodon, teeth of others still younger, teeth of the hippotherium, teeth of varieties of sus, also the head and teeth of true horse but of diminutive size, skull and horns of two varieties of antelope, teeth of four varieties of deer, horns of buffalo, teeth of oxen, skull and teeth (and a single detached tooth) of an animal supposed to be the babyroussa; a comparison with a recognized individual shewing a very marked resemblance, not to say positive identity. There are specimens of Gavial identical with that found in the Indus at the present day. Two of true crocodile, one of these being very perfect with the upper and lower jaw, and shewing a most satisfactory identity with the round-nosed animal found at the present day in most of the Indian rivers. I examined a very fine specimen of a recent individual in the Museum at Bombay, and found in this the same peculiarities as in the fossil,—the same roundness of muzzle, the same indentation in the upper jaw, the same alternation of large with small teeth, in the same order and at the same intervals; and though the absence of the cartilage and bone which forms the extremity of the nasals, makes it impossible to say that the fossil had two orifices, through which passed the points of the canine teeth, as in the recent individuals of the genus, yet the size of these teeth, in each case, is the same; and the extension and completion of the nasals would require such an orifice in the fossil as in the recent specimen, to afford room for the point of the tooth.

There is a skull, portions of jaw and teeth, and several detached teeth of rhinoceros in beautiful preservation. I compared these with the plates, (Cuvier, des Ossemens,) shewing the teeth of the rhinoceros found in the Basin of Paris; some correspond in size and general character so nearly, that I had considered them identically the same, but I fortunately corrected my opinion by the judgment of a celebrated authority, who, agreeing that the general resemblance of some of the teeth was very striking, yet pointed out an important distinction, which is wanting in the fossil of Montmartre; this may be noted hereafter of the several specimens of Perim rhinoceros, one of which is far larger than any of those drawn and described in Cuvier.

I have also some bones and teeth as yet not recognized or doubtful.

There is a great field for further inquiry as to the Perim fossils. I have sent to India to obtain some of the specimens I left there, and I have also taken steps to prosecute the search at Perim; the whole subject will have my best attention, and I trust to have hereafter opportunities of directing and superintending the search in person. Now or then, should there be any results deserving it, I shall be proud to communicate them to the Society.

Three views of the head and the grinding surface of the teeth have been lithographed together, and proofs forwarded to the Society.

Art. XIX.—*Extract from a Letter addressed by* Professor Westergaard *to the* Rev. Dr. Wilson, *in the year* 1843, *relative to the Gabrs in Persia.*

. . . .

I am to-day at Ser Yazd, eight farsakhs south of Yazd, on my road to Kerman. . . . . As I suppose the Gabrs interest you most, I will begin my rambling letter with them. I heard at Shiraz, where there are occasionally a few Gabr shopkeepers, that in Kermán there are only a few illiterate Gabrs; so when I at Darebjard heard that the road lies for six days through a complete desert, without any habitation, or the least cultivation, I determined to go straight to Yazd, which would be passing over ground that had been travelled by few or no Europeans before. I found at least on my map many places laid down wrong, even Yazd; and I am now on the road to Kermán, only on account of my having heard at Yazd, that though there are there only one hundred houses, (or about four or five hundred Gabrs), still they have from olden time a good many books, far more than there are in Yazd; whether it be true or not, I shall tell you by and bye.

Now, for the Gabrs in Yazd. There are in all one thousand Gabr houses in Yazd, in the mahalla or quarter named Pusht-i Khána Ali, where alone they live, and in the surrounding villages. A few only are merchants; the most part live poorly and wretchedly by tilling the ground, and other manual occupations. As one can scarcely reckon more than four, or four and a half, to each house, the whole population does not amount to more at any rate than five thousand, including men, women, and children. A few merchants travel now and then to Shiraz, Teherán, and Káshán; but their families remain at Yazd. . . . They stand far below, I will not say the Pársís, but below the lowest Hindús. Of their religion they know nothing whatever; in the temple they light the fire only for a few hours during the beginning of the night. They consider smoking as improper for the Dasturs only; and the Dastur himself offered me a kalian in his own house, when I did him the honour to call on him the first time. There are few dasturs,—Námdár, Rashíd, Rustam, Dinyar; the first two are sons of Kai-Khúsrú and Sharivar, who both are said to have been good Zand and Pahlavi scholars, *(inter cæcos regnat luscus)*: their sons are as ignorant as the rest. I stopped at Yazd eleven days, and though I often went out among them, I did not see more than sixteen or seventeen books in all; two or three copies of the Vandidad-Sadé, and the Izeshne, (which they call Yaçh), and six or seven of the Khurdah Avasta, of which I got two and part of a third. These, besides part of the Bundehesh, and part of another Pahlavi book, were all I could get, though I tried hard to obtain more, especially a part of the Izeshne with a Pahlavi, or as they say Pázand, translation, of which there is only one copy in Europe, at Copenhagen. Namdár said it belonged to Rashíd, and he assured me it belonged to a Mobed named Mandager, in the village of Muhammadabad, twelve leagues off. A complete Bundehesh belongs to a Mobed named Rasjid Mahr, but he would not part with it. Except of the Khurdah Avasta, they have no Persian translation of any part of their books. I saw in one of their houses a boy learning by heart the Vandidád, of which of course he did not understand one syllable. I mention this fact, only because I thereby conceived some very strong doubts about what I would call the Zoroastrian authenticity of the Zand books; I do not doubt about their Sassanian authenticity,—that we have them nearly as they were compiled or re-written in the reign of the first Sassanians,—but how did the dasturs then accomplish their task? There are at Persepolis inscriptions from Darius, the son of Hystaspes, from Xerxes, and from Artaxerxes the Third. Even in the inscriptions of Xerxes a decline of the language is apparent; and in the century that elapsed after him, the language had declined with a most astonishing rapidity, for the inscriptions of that epoch are composed in the most barbarous language. Now, a language is only declining into a state of barbarism, when the intellectual powers of the people, their manners and civilization are doing the same. If that was the case in the time of the Achæmenians, what must it have been during the Grecian and Parthian dynasties, when mighty kings, with all their power, tried to destroy an already declining religion and civilization, and to introduce a strange faith and foreign cultus? Now, when the Sassanian ruler collected his grand Synod, did then written books exist, or was the Zand-avasta compiled only from oral repetition, a repetition of sounds considered holy, but either not at all, or only half understood? If the latter be the case, it not only easily accounts for the barbarism of language that not seldom occurs, for the rules of all rational grammar being often neglected or transgressed, but it destroys the very Zoroastrian authenticity of the whole; for though we may know what they knew at that time, and what they remembered, and how they did know and remember it, still we are left in the dark as to what the Bactrian prophet[1] really did say or write; and though the Zandavasta may contain the Sassanian fire-faith, still it can no longer be considered as a monument of antiquity; to use a rather rude expression, the Zandavasta is a modern dunghill, where you may find ancient pearls. I shall keep this opinion in view when I am compiling a Zand grammar and dictionary, which I intend to do.

Now to return to Yazd. I have given you an exact account of the state of the Gabr literature and knowledge, and proceed to speak of the people themselves. The more wealthy are dressed like the other Persians, but in yellow, and with yellow turbans; the poor rayahs wear a sort of short tunic, and short narrow trousers that reach to the knee only; the females are dressed in rather gay-coloured trousers and petticoats,—all go unveiled both young and old; but they ought to cover their faces, for it might be as well to fancy that there were some beauty worth hiding. . . . There is one fire-temple in Yazd; and as here was no Honourable Company to watch with parental care over the religious feelings of the people, and being myself on terms of intimacy both with the Vazir and Darogha, I was determined, come what would, to see a real fire-temple. Therefore, I one afternoon got on horseback, and inquiring my way, I rode (well armed, but alone,) to the Gabr quarter Pusht-i Khánah Ali; and when I came there I inquired after the fire-temple. To my great surprise I found that there was not the least difficulty in the world; they were most willing to show me every thing. The temple was adjoining a private house, or rather formed part of a house, consisting of a large room with three doors,—two on the sides leading into the temple, the third at one end into the most holy, where the fire-altar is placed a little to the right: the fire was extinguished; nothing was there but the fire-altar, with the instruments to take coals and stir up the fire. Outside, on a stone, stood the Havan and Dastah, six inches high; of the same height were the two máhru to hold the wood, and the tarahum khan, all of brass, with the masharmu, the water-pot; the charághdan, or lamp-stand, was of wood. The Ráspi sits on a hide to the left, and the Zud on the floor to the right of the door. *Voilà tout!* The stool whereon the book is placed is called Rán. There are three atesh adván; the one I saw was in the house of Kai Khusru, and contained the place where the useless fire is thrown, and the vessel atesh piadah, wherein it is carried to this place. The Dakhma is situated one a half farsakhs south of Yazd, and one farsakh from a little village, Ali Sháhí, close to the Kermán road on a sloping hill. It is surrounded by a stone wall, about fourteen feet high; the door is in the north corner, about six feet from the ground, and here the wall is a little higher. You climb up to the top through a little hole three feet square, closed by a stone; I had some difficulty in getting this open; but at last, by the help of a sword, I succeeded, and walked, or rather crept in, in spite of "the devil Nasus and all the other devils!" The Dakhma is divided into two parts by a wall running from west to east. On the north the corpses are placed on the bare ground —men, women, and children indiscriminately,—which could easily be seen from the remains of their dresses. They were all miserably mutilated by birds of prey, two of which I disturbed at their breakfast. The Parsis say that their dead bodies do not smell at all; but here I assure you that I was unpleasantly convinced of the contrary by two corpses five or six days old,—perhaps on account of the little reverence they pay to the fire! The denuded bones are afterwards thrown down into the southern division where the ground slopes considerably, and where a large heap of bones lay quite blanched. Some of the bodies lay on the stomach, which I turned round with my whip, and was surprised to find how light they were. The skulls are as hard as any other skulls, which you may mention if you should take it into your head to publish a new edition of Hyde.

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[1] Query: Would Zoroaster, or the Golden Star, as the Greek translator has his name, be nothing but a mythological or allegorical person,—a star in latter times drawn down from Heaven, and made man, like the Grecian and Scandinavian gods? Would he be Mercury?

I heard at Ser Yazd, where I began this letter, that the road was closed, that a kafilah had been a few days ago plundered in the desert about two days' march from Ser Yazd. I got, of course, into a terrible fright, and stopped there one day to wait the arrival of a large kafilah that was expected, but did not arrive. To wait longer was out of the question; so I procured with some difficulty a guide, who assured me he knew the whole country well, and set out next morning with the moon. A little kafilah of asses had been lying two days at Ser Yazd, and had in that time plucked up courage enough to prepare for starting this morning. The asses were loaded, but unfortunately at the moment of starting, the sneezing of a man put to flight the courage of the kafilah, and they made up their minds to stay quietly where they were. The road runs over a complete sandy desert for five farsakhs to Girdi Kuh, (round the hill,) containing six houses and a few fields, and then again there is a desert to Anderun, other five farsakhs. That was my first day's march.

Anderun has a little castle in the gateway, at which I put up, and about thirty houses; why the place is called Anderun nobody could tell; it is at any rate a singular place to build an Anderun in. The next day was to take us to Anár, over a desert of twelve farsakhs, and it was here we might expect the robbers; I started with the moon, and got well over the first seven farsakhs to a little spring; I halted there for two hours in the shade to refresh the Yábus, and wait for the guide, who had caught fever from the heat of the sun, and had stayed behind; when he arrived, and we had filled our skins, we started again. The guide now led us a wrong tract, which took us first south-east and then easterly, and after three or four farsakhs he could get no farther, but dropped down. We had no water, and did not know when we should get any; the day was hot, the animals tired, we were thirsty, so I was obliged to leave him to take his chance, and push on as quickly as possible. At sunset I discovered, to my great joy, a little village with a few trees at the distance of one and a half farsakhs, which I reached at last after two hours' further riding. Here the people were uncommonly civil: there was much more listening and far less talking than usual, so I got soon comfortably settled in the little gateway, and I have never relished any dinner so much as I did my frugal meal of bread and water; for a ride of fifty-six miles, (the distance being fourteen or fifteen farsakhs,) will give one a good appetite, especially when one has travelled the day before nearly forty miles.

The name of the village was Deh-Khawachah. I gave a man two karunis, (two shillings,) to go with water and bread, and look for my guide, and bring him in whether dead or living; both arrived alive the next morning. Here a little fruitful valley begins, eight farsakhs in length, with sixteen small villages. Being completely knocked up, I rested the next morning, and made in the afternoon a march of four farsakhs only to Bahramábád. Here was a good mahmankhanah, built a few years ago by a Haji, but scarcely any supply could be got. The fourth day took me first to Shamsábád, where the fruitful valley ends; and in the afternoon to Kala Aga, a little town with two hundred houses and a small bazaar, five farsakhs from Shamsábád. We arrived so late that we had the greatest difficulty in getting what we wanted. From this place in four days I reached Kermán, where I arrived on the 26th. . . . . .

The Gabrs here are greater brutes than their brethren at Yazd. They had only two copies of the Vandidad and Yaçna, but a great many of the Khurdah avasta, which, however, they would not part with. They lighted the fire of the temple in honour of me with very few ceremonies; it was at noon, an unusual hour. No one here can read Pahlavi. They complain, that when Aga Muhammad Khan gave the town up to indiscriminate plunder and slaughter, most part of their books were destroyed, and great numbers killed. They are by degrees becoming Musalmáns; and it is at any rate a change for the better. . . . .

Art. XX.—*Visit to the Bitter Lakes, Isthmus of Suez, by the bed of the ancient Canal of Nechos, the "Khalij al Kadim"* خليج القديم *of the Arabs, in June,* 1842. *By* Captain Newbold, F.R.S.

[*Read June* 21, 1845.]

It will hardly be necessary to premise that the Red Sea and Mediterranean are separated by a strip of desert about seventy-five miles across. The ancient kings of Egypt, struck with the vast importance of uniting the navigation of the two seas, at an early period attempted this great work. Nechos II., the Necho of Scripture, and son of Psammeticus, after defeating the Assyrians, and slaying Josiah king of Judah, B.C. 610, commenced a canal that was to unite the Red Sea with the Pelusiac or eastern branch of the Nile, which communicated with the Mediterranean, almost directly north from the present Suez, near the ancient city of Pelusium. Some give it a much greater antiquity, attributing it to the great Sesostris, or Rhameses III., the founder, among other vast works, of the Giant Hall of Columns of the Palace at Carnac, and under whose reign Egypt arrived at her zenith of power and prosperity. This canal is supposed by Herodotus to have joined the Nile near the old Bubastis, to have been filled by the water of the river, and to have been completed, or rather continued, by Darius Hystaspes. Diodorus Siculus states it to have been finished by Ptolemy II. Herodotus tells us that the first works, which cost 120,000 men their lives, were arrested in their progress by the oracle which Nechos consulted, and which declared that the canal would open Egypt to foreign invasion. Its width was calculated by Strabo at one hundred and fifty feet, and by Pliny at one hundred feet. Herodotus informs us, it was broad enough to admit two triremes to move abreast, and that it required four days for a vessel to pass through it. Strabo says, it was provided with water-gates (locks?) and broad enough to admit ships of the largest class. Pliny calculates its depth at thirty feet.

Why and when it was abandoned are uncertain. Aristotle and Pliny state that it was not opened at all in consequence of its bed being supposed to be higher than the surface of the Delta of the Nile, which it was feared would therefore have been inundated by a volume of sea water from the Red Sea at Suez. The latter of these writers

e canal never approached the Red Sea nearer than the
nd was only thirty-four miles long: but the sites of
opolis, and Phagroriopolis which rose in the desert on
have been attributed to the benefit resulting from its
dicate a much greater extent and importance.
n Emperor Trajan not only renewed it, but added a
known by the name of *Amnis Trajanus*, which passing between
olis and Babylon, joined the Nile near Memphis. It seems
to have fallen into disuse after Egypt passed into the hands of
rabs, but was re-opened by Amrou, Viceroy of Egypt, by order
Caliph Omar, in order to the better supply of the Hedjaz with
eat, &c., during a famine that then prevailed in the Mohammedan
y Land. About one hundred and thirty-four years afterwards it
appears to have been stopped by the Caliph Mansur, with the view of cutting off the supply of provisions sent to some insurgents at Medina. This canal deviated from the course of the old one, and opened on the Nile at Old Cairo, whence I traced its course about eight or nine miles into the desert, to the north-east of the *Birket el Hajji*, Lake of the Pilgrim, to Mecca. Since the time of the Caliphs, the canal has never been re-opened; it was left for the genius of Napoleon to promulgate the idea of reviving and perfecting the great work of Sesostris and Nechos: but momentous events sealed Egypt to the comprehensive schemes for her improvement meditated by this master mind. It remains for Mohammed Ali, who has already immortalised himself by uniting the port of Alexandia with the navigation of the Nile, in the construction of the Mahmoudieh Canal, to put into execution the project of Napoleon, an undertaking which, if successful, will rank high among the triumphs of human skill and labour over the obstacles of nature, and be a far more glorious monument to posterity, than those useless piles of limestone, the Pyramids.

The port at the head of the Red Sea in the time of Ptolemy Philadelphus was called Arsinoë, from his sister and wife, and subsequently Cleopatris; and, by the Arabs, Kolzum. The ruins of the latter town, which is supposed to have occupied the site of Arsinoë, are entered immediately after quitting the north-west gate of the modern town of Suez, and consist of a number of sandy mounds, occupying a space about as large as the present town, with scattered fragments of pottery, tiles, glass, and earthenware, often containing bitumen, as occurs among most of the ruins on the banks of the Nile. After passing these mounds, and crossing some salt pans on the north-west extremity of the Gulf of Suez, close to the sea coast, which is here flat and sandy, the Arab guides pointed out to my fellow-traveller, Captain Blogg, and myself, the embouchure of what they] called the *Khalij al Kadim* خليج القديم, which we hastened to see.

It is marked by low banks of sand, the highest part of which did not exceed six feet in height, and ceased altogether about fifty paces from high water mark. I was unable to find any traces of banks below the water of the Red Sea, here very shallow. The banks abounded with sea shells, and masses of crystallized gypsum; the breadth of the bed between them was sixty-four paces. Diverging slightly from the sea shore we traced them in a northerly direction, varying from four to six feet in height, often interrupted and indistinct, to the camel track of the great caravan from Cairo to Mecca, where they pass round the head of the Red Sea. The surface of the country, from the commencement of the canal to this, was flat, little raised above the surface of the sea, and covered with sand and gravel. The bed of the canal was formed of the same sand; firm, and in some places moist enough to admit of the growth of a few salsolas, &c., the verdure of which, contrasted with the parched aspect of this dreary waste, over which the hot *khamsin* was blowing, was by no means unrefreshing. A thermometer on the sand of the desert exposed to the rays of the sun, sky clear, 141°·5.

Here was observed a heap of stones which an old Arab hajji who accompanied us said, had been piled up as a land-mark by the pilgrims to Mecca to guide them to the spot where they were to round the head of the sacred gulf. These piles are called *alámát* علامات, standards or marks, by the Bedouins; near it lay the skeletons of several camels, bleached by the sun,—"ships of this desert," wrecked in this sea of sand. The hadji informed me, that during the winter (*fi'lbard* في البرد) the waters of the Red Sea rise suddenly and are impelled over this wide extent of now dry sand by the violence of the south-east winds. Suez bore hence S.10W., on its right the mountains of Ataka or Deliverance, through whose defiles the Israelites were pursued to the shores of the Red Sea; and on our left or to the eastward, the wilderness of *El Tih,* in which spring the wells of Moses, which I had visited only two years ago.

Beyond this, the embankments of the canal are more distinct and continuous; and, at about the distance of twelve miles northerly from Suez, were as perfect as if piled up a week ago, twenty feet high, formed of gravel and gypseous marl, and upwards of seventy paces apart. They become again gradually indistinct on reaching the southern extremity of the Bitter Lakes: a few low rocks of limestone break the monotony of the gently undulating desert. The surface of the bed was quite dry, but a little below it consisted of a dark, moist, reddish clay; on whose surface grew a scattered vegetation of thorny acacias, tamarisks, and salsolas. The dimensions of the lake it is difficult to ascertain, forming, as it does, but a very slight bankless depression below the level of the surrounding desert, the lowest and moistest parts being scantily clothed by the vegetation just mentioned. The surface of the surrounding track is covered by firm sand and gravel, chiefly of rolled pebbles of chert, quartz, and Egyptian jasper. In the bed of the canal, and in the sand of its banks, I found in an unfossilised state, many marine shells of species now existing in the Red Sea, viz.; Pecten, Nerantius, Murex, Scolopax, Cytherea, Callipiga, &c. Water of a saline bitter taste is found about a foot below the surface in the bed of the lakes; hence the name given them.

The surface of the desert around the lakes is rather more undulating and rocky than that surrounding the head of the Red Sea, but preserves the same barren and cheerless aspect. The Arabs assured us, that the same physical features prevail to the shore of the Mediterranean, where it again becomes flat and marshy. The same substratum prevails, viz., a tertiary calcareous rock, containing marine shells and corals of loose texture.

Not a vestige of animal life was seen between the ruins of Kolzum and the Bitter Lakes, save the footsteps of the bird "Bagha," and the track of a hyena that had stalked across the bed of the old canal.

The principal obstacles to establishing a navigable stream of water direct through the Isthmus are not the shifting nature of the sands, the amount and height of rocks to be blasted, and the depth of excavation necessary: the observations of Napoleon's surveyors go to show that the extreme height of the Isthmus above the sea's level is but insignificant; the expense calculated was £700,000; and as to the canal being choked up by the sands of the desert, my own observations tend to prove the very trifling amount of drift that has accumulated in the old channel since the days of the Caliphs.

The greatest difficulty to be surmounted appears to me to be the alleged shallowness and shoaliness of the Mediterranean, at the point nearest to Suez, viz.: the bottom of the Pelusiac Bay, of which, and the country between it and the northernmost of the Bitter Lakes, a careful survey is indispensable. Between Suez and the southernmost of this chain of lakes which are so favourably located for the undertaking, no greater natural difficulty exists than between Adfeh and Alexandria. The shallowness between the head of the Red Sea and the anchorage three miles off Suez would be a drawback: but one which, at the most, could be obviated by transshipment. The present width of the channel of the old canal, as far as the Bitter Lakes, is more than sufficient for all purposes; it requires deepening; the banks put in repair; and fresh levels taken. The old channel, which turns off westerly at the Bitter Lakes towards the Nile must be there deviated from, and an entirely new cut made northerly to the bay of Pelusium.

If, as has been stated, it be true, that the water of the Red Sea at Suez is thirty-two feet higher than that of the Mediterranean at Pelusium, a current would be formed, which might be turned to advantage in clearing and deepening the channel, by the construction of a pier or an artificial channel of masonry at Pelusium. The difference of level of the two seas, has been, by some, calculated only at twenty feet, and latterly, I understand, at seventeen feet. I was informed by an intelligent Greek, Kodsi Manouli, that Suez, which stands nearly at the level of the Red Sea, is eighteen feet higher than the general level of the Delta of Egypt: hence, perhaps, the fear anciently prevailing of the Delta being submerged by the opening of the canal. These facts, coupled with that of my having observed recent marine shells in the bed of the canal and of the Bitter Lakes, militates against the assertion of Herodotus, that the former was filled with the fresh water of the Nile. It is also conclusive, from this trip, that the canal, latterly at all events, communicated with the head of the Red Sea.

As my detention in Egypt was quite unexpected, the excursion was made without any instrument to determine the relative levels of the Bitter Lakes and that of Suez. Judging from the flat and gently undulating character of the intermediate tract of desert there cannot be many feet difference. That their bed is higher than the level of the Red Sea, is indicated by the greater depth of the channel of the canal in their vicinity, and the apparent general rise of the country.

In a paper on the Geology of Egypt, read before the Geological Society of London, I have shown that the shores of the Red Sea have undergone considerable elevation; and in a trip into the desert of El Tih, I found vestiges of an ancient beach near the head of the Gulf of Suez, left as the land was gradually elevated. That this elevation, in the vicinity of Suez, has been remarkably slow within the historic period, is proved by the ruins of Kolzum still being washed by its tides. According to the author of the *Ajaib al Makhlukat*, عجايب المخلوقات, the Red Sea was called the Sea of Kolzum from this city, which, as also that of Yemen, is mentioned as standing on the sea shore. After stating that the "God of glory and majesty had drowned Pharaoh and his host in this sea:" he proceeds to relate a

great and remarkable physical change in the features of the country now forming its shores by the admission of the waters of the ocean. In ancient times, he says, a great space and a mountain existed between Yemen and the sea, when a prince, with the view of ruining the country of his enemy, cut the mountain for the space of an arrow's flight and let in the sea upon the land of Yemen: the inundation acquired such force that it could not be checked; it overwhelmed many cities, and a great sea was formed which came nigh to the land of Yemen, and extended to the cities of Juddah, Yembo, Medin, Ailah, (Akaba, the Elath of Scripture,) and Kolzum.

بلاد بسیار را بفساد آورد و بحری عظیم پدید آمد و دریا بارض
یمن نزدیک شد و تا جده و ینبع و مدین و آیله و قلزم
برسید

The singular Gulf of the Red Sea, which Cazwini styles شعبه من بحر الهند, *Shubah min Bahr al Hind*, literally, a fissure in the rock, (where water stands or flows) from the sea of Hind, is on the line of the volcanic zone, which I have traced along its shores by Gebel Ezzeit, the warm springs of Tor, the semi-active island volcano, Gebel Tir, through the straits of Babelmandeb to Aden; the existence of which is doubtless connected with the profuse growth of its submarine forests of coral.

In the Bengal Asiatic Society's Journal, (No. 132, 1842,) I have already mentioned the possibility of the limestone beds, which extend easterly from Egypt far beyond the borders of the Red Sea into Arabia and the Holy Land, having been once continuous, and the portion now occupied by the Red Sea having been engulphed, like the centre of the Val del Bove, by a great subterraneous displacement of matter. The cliffs on each side have a singularly disrupted appearance, particularly in the Gulf of Suez. The tradition of Cazwini seems to strengthen the theory of the origin of the Arabian Gulf: the removal of the mountain which intervened between the sea (the Indian Ocean) and Yemen was probably the sinking of the lower parts of the mountain barrier of Babelmandeb, the Gate of Tears; by which the present narrow strait was caused, and which let in the Sea of Hind on the sunken tract now forming the bed of the gulf, and which flowed up so far north as Kolzum and Akaba, still at its head.

Art. XXI.—*On the Secret Triad Society of China, chiefly from Papers belonging to the Society found at Hong Kong.* By the Rev. C. Gutzlaff.

[*Read 15th February*, 1845.]

The following is the account given by the Triad Society of themselves and of their origin:—

The Selús (a Tatar tribe) invaded China, under the reign of Kang-he, (about 1675—79), and greatly disturbed the country. The people were very much alarmed; and the Manchús sent an army to resist the invaders, which was several times defeated without gaining a single advantage. Upon this, an officer named Kwŏ-ting-hwuy returned to the Court to ask for assistance, simply stating, that whilst the enemy were making inroads in the country, there were few soldiers to oppose them, or generals to command; he added, that the troops wanted provision, and that he came to give a representation of the state of things. The Emperor, on receiving the report, instantly called a council, and after some discussion, it was agreed to declare by proclamation, that if any able man would come forward and lead the army into battle, he should receive a present of 10,000 taels and a dukedom. This welcome news reached a monastery in Fokien, where there were above 1200 bonzes, who immediately proceeded to the capital and begged to be admitted to the imperial presence. One of their number was forthwith appointed commander-in-chief, and he successfully routed the Selú army. His victory was complete, and he returned in triumph to the Court; Kang-he received him and his followers with great courtesy, made them liberal presents, and then sent them back to their homes. They had scarcely left the Court, when some traitorous ministers, envious of their good fortune, denounced them as rebels, who had plotted in secret the ruin of the dynasty; and obtained permission to set fire to their whole establishment. The accusers, accompanied by their minions, hastily went in pursuit of the bonzes; and on arriving at their temple, were most hospitably and kindly received; during the night, however, they surrounded the building, and before the inmates awakened from their slumber, the house was in a blaze. So well had their enemies concerted the plan, that only eighteen escaped of the whole number; and out of those thirteen died of starvation. The remaining five bonzes then thought it prudent to retire into utter seclusion, to escape the vigilance of their ey had, however, not yet lost their warlike habits; teen years old, wishing to become a soldier, requested join their society. Surprise was expressed that a a tender age should wish to embark so early in the s; and the candidate replied, that he was Choo-hung- of the deceased Emperor Tsung-ching, of the old Ming a lady of the Western Palace. He added, "You must recovering my empire and revenging my parent, and I shall you in punishing the destroyers of your temple." The iving the great intelligence of the youth, declared him heir crown, and forthwith took their way to Hway-choo, in the pro- f Kwang-tung. They arrived at the foot of the mountain of at a temple, where some other bonzes most hospitably received here they consulted what course to pursue in future, and it animously resolved to establish a fraternity, whose sole object be to revenge the wrongs they had endured. Misfortune, ever, scattered them; and though their numbers increased by thousands, they remained concealed for a long while in expectation of better times. Gradually they assembled in various districts; and towards the close of the reign of Kang-he, they engaged in many an arduous struggle with the Manchú army. In the thirteenth year of Yung-ching (1736), on one occasion their main body was hotly pursued by the furious soldiers of Government; they had no provisions, and it was then resolved to disperse, and by secret signs and correspondence up keep a connexion with each other, until the day of vengeance should arrive. To give greater effect to their plans, they organized a general plan, and divided themselves into separate lodges; of these there were at first only five, situated in various provinces of the empire; they afterwards increased to thirteen, and some others have been subsequently added. Every lodge has its peculiar standard, and instructions are given to each as to the part it shall take in the great struggle for vengeance. The constitution is entirely military, and the means by which the grand objects are to be obtained, violence and rapine. The leading maxim is:—"We are all the children of the same parent, and though living in different parts of the country, will call upon our relations to march, on a future day, to do battle at Nanking, and to establish the cause of our ancient lords. This we promise with our blood."

Every one of the brotherhood is initiated in a variety of secret signs; all are taught certain symbolical sentences, generally in verse, and intelligible to the votaries only. All their actions are marked by some peculiarities, so that, if any of the association are strangers in a place, they may easily be recognised by their friends. This extends to the very putting on, and the cut of a jacket, the wearing of the shoes, and other trifles, that would escape the most inquisitive eye unacquainted with the mysteries attaching thereto.

The following verses are recited at the introduction of a new member:—

"Behold your brother, void of talent, who, obedient to the grand fraternity's call,

"Brings a candidate to your portal, to prostrate himself before the glorious altar;

"To-day abiding in the peaceful hall, he will to-morrow grace the array of battle,

"Where, on both sides stand the heroic bands, who, turning towards Nanking, burn incense.

"Behold, I enter the eastern gate with my brave companion,

"For, at the western port, a traitorous minister received his doom!

"Our illustrious prince, receding from the North, dwells in the South,

"Surrounded by the army who will maintain his sway over myriads of subjects."

The new votary is now addressed in rhyme, and required to state his motives for appearing in the assembly. He answers:—

"Over rocks and stones my foot has trod;
"I have braved the storm and traversed the cloud;
"I am one of your braves, who, with undaunted mien,
"Enlists under the bright banner that has never quailed.
"I haste to the five lodges of our great family,
"Ever to live in delightful union,
"Until our master rules over the flowery land."

The meeting now describes the unbounded power with which the association is invested; and says, that only slaves venture to oppose its progress. The novice answers:—

"Far and wide your influence extends unseen.
"At my distant home I heard your spreading fame,
"And here before the sacred fire I perform my vow,
"Aspiring to become a brother in intimate union.
"Here with the helmet by ancestors bequeathed,
"I make known before the brotherhood my heart's desire:
"In this pavilion I solemnly swear to join with you,
"And avenge our wrongs when the day shall come."

answers:—

onfessions of him, who now begs admittance."

then opened to inscribe the name of the new member, ses are recited.

is afterwards anointed with blood, when he says, "As ıow dyed with blood, I will never betray the secret; eveal it, may my own blood flow from the seven pores."

ns thus:—

being perfectly aware of my engagement, join the with them, like Kwan and Paou, in the communion of d the same g standing and harmony as Luy nitation of of antiquity, I form this con- wishing entirely to adopt the principles [of the fraternity]. hereby solemnly swear to bind myself for ever to you, with e than parental and fraternal affection, before this altar on which cense ascends. May we for ever unite in removing malice from gst us; may we prove true to each other hand and foot, walking her like a pair of wild geese through this sublunary life.

"May a lucky star shine on us whilst performing this oath, and our fortune be never on the wane. May a lucky star shed its light upon us."

The association is founded upon the principle of extension to the utmost limit of the Chinese empire. Its emissaries traverse every part of the country, according to an express injunction in the code of regulations, in order to receive new proselytes into the bosom of the fraternity, who go through a regular course of training, of which a peculiar drill in arms is the principal feature. This is generally done by night, or in remote parts of the country. All classes are permitted to join; and amongst the Triad Society, there are at present mandarins of low degree, police runners, soldiers, merchants, brothel-keepers, gamblers, and needy characters of every description; for the association promises mutual support in every emergency.

The following rules are strictly enjoined upon the members of the fraternity:—

1. Whosoever receives a reward for the apprehension of a brother, shall be instantly dismissed and declared an outlaw. [The life of such an individual is then no longer safe, for he is a marked man.] 2. No brother may be connected with two sisters. 3. None shall ever betray the principles of the association; he who does so shall cease to exist [be scattered to the winds]. 4. Every brother is forbidden to use improper or opprobrious language to another, or to

his family; and he who does so shall either be fined one hundred cash, or receive eight blows. 5. The votaries are prohibited from selling their badges, under penalty of a fine. 6. Contributions are to be for the common use; and whosoever, for his private interest, collects any money, shall be severely punished. 7. Every one must execute the orders given to him, and whosoever proves negligent will receive a very severe punishment. 8. The body demands implicit obedience from all its members. 9. These regulations are for the observance of all; and whatever else is to be ordained, whether good or bad, shall be determined in a public assembly, and be binding on all the members.

The brethren are taught songs for all occasions, which they must sing as occasion requires. For instance, when they wash their faces, they sing:—

"The red napkin covers the bowl containing the water of three rivers, which, like our brethren, comes from all parts of the world. I wash myself with patriotic emotions, and thus entail on myself happiness and long life. But should I prove a traitor, then may my bones, which have just been rubbed, be turned to ashes."

When the great standard is erected, which is always done in their large assemblies, they sing:—

"Wave, thou great banner, worthy companion of the imperial abode. When thou sheddest thy lustre, may a hundred defenders arise to carry out the plan; and may the two dynasties of heaven's sons be united, under thy golden borders. May we revert to the Ming and again enjoy tranquillity!"

Every flag, of which they have several, is accompanied when hoisted, by a peculiar chorus. The grand theme is always restoration of the Ming dynasty. They have peculiar summonses and printed forms to call the army together, and to facilitate travelling as well as all other operations; they enjoin upon every brother to receive an associate gratuitously into his house, for two days at least; and to have constantly a sum of money in store, which may be used on any emergency. The public treasury is, however, not filled by joint contributions merely, but likewise by robberies, in which every participator must send his share. Such undertakings, however, are veiled under the name of patriotic levies to punish the enemies of the commonwealth, and by depriving them of all their goods to render them harmless in future.

To maintain unanimity and propagate the spirit of resistance, they convoke frequent meetings, at which the oldest and most experienced brethren preside. They here renew their oath of fidelity towards each other, denounce traitors with dreadful curses, and even mingle their blood together as a token of interminable friendship. All this is done before an altar of incense, or a large fire, the emblem, as they term it, of destructive and impetuous purity. These assemblies end with drunken debauch and new resolves to co-operate in every patriotic, that is, wicked, design.

In punishing any of the fraternity who break their engagement, they are very severe and relentless, assuming to themselves the power of life and death, which is, however, seldom exercised. There is a citation in verse, which reminds one very much of that of the German Fehmgerichte of the middle ages, by which, in case of treason, witnesses are summoned to appear in order to investigate in full conclave the guilt or innocence of the accused party. In case of guilt being proved, the sentence is pronounced by saying,—"Die, thou traitor, that thy body may be food for the birds of heaven."

The Triad Society acknowledges the following religious principles:—

"We consider heaven as our father, the earth as our mother, the sun as our elder brother, the moon as our elder sister; we pay respect to the true Son of Heaven, worship our five ancestors [the five priests who were the founders of the association,] treat with deference our brethren, and devote ourselves to a life of pleasure." To heaven, earth, and mankind in general, the three powers that constitute the universe, they pay peculiar homage, consisting in the recitation of certain hymns.

The members have established a symbolical language in which they can easily converse, without being understood by a third party. If they are in company and wish to communicate to each other some secret design, without attracting any notice, they place the tea cups in various forms, and the way in which they pour out tea conveys their intention. Even in lighting their pipes, or smoking opium, they observe a certain rule, and convey clandestinely their meaning. They look upon themselves as a very strong body, able to effect great purposes, and certain of the final result of their endeavour to place a Chinese monarch upon the throne.

Every one who enters the community receives a certificate, signed by the witnesses who were present when he pronounced his vow of eternal fidelity. He is then permitted to put on a particular girdle, and the uniform of the confederation, and to wear a badge at the meetings. The inscription on the badge is as follows:—

"We regulate our conduct in conformity with heaven, and from every region we call forth future happiness." Under this is written:—

"Myriads, [look forward] to the overthrow of the Manchús, and the restoration of the Ming!" Four characters at the corners signify, "the pouring waters of the deluge." Above is written, "May the descendants of Tang prosper;" on the other side, "May there be ten thousand myriads of revolutions." In the middle, "This is to remind us, that we are bound together in harmony, which unites myriads." The other portions are emblematical—intelligible to the initiated only. In their written intercourse they preserve the same enigmatical expressions, using the most common characters in a different sense.

It is a remarkable circumstance, that, with all their ardent desire for political changes, the fraternity only once, during the last war, appeared on the theatre of political conflict. This was on occasion of the occupation of Cha-poo, when they offered to turn against the garrison, of whom many were in their interest, and to act as fencibles with the English army in the capture of Hang-choo. As their offer was not accepted, they created a disturbance in the city, and all their adherents left the army, no doubt to carry on a system of robbery and plunder. Their power, however, is now on the increase, and it is by no means improbable that they will one day or other fraternize with some of the patriotic societies, which are now forming in every part of China. The object of these associations is to uphold every thing ancient against barbarian encroachment, and defend the rights of the Celestial Empire. The great movers are the scholars, who have studied the maxims of the sages, and who wish the world to be ruled by Confucius; but it would not be at all extraordinary, if these ambitious incendiaries should use the Triad Society as an instrument for carrying their designs into execution.

ART. XXII.—*The Cinnamon Trade of Ceylon, its Progress and Present State, by* JOHN CAPPER, Esq.

(*Read February* 1, 1845.)

IT is impossible to say at what particular period this spice first became known to the world, though there is but little doubt that the aromatic properties of the bark were no secret at a very early date.

The first mention we have of it is as being used by the Israelites on occasions of sacrifice, and afterwards by the Hindús in burning their dead; for these purposes the entire stick was probably used, or at most the bark may have been rudely stript from the tree without preparation. From being employed on sacrificial occasions, it would not be difficult to imagine that the priests, who in those dark days were the only persons practising the then mysterious art of medicine, should have brought the spice into use for various disorders, and for this the peel or bark was doubtless cut away from the sticks without regard to its appearance.

"The utmost Indian Isle Taprobane," or in more modern language Ceylon, was known to the traders of Egypt at the period when they supplied Imperial Rome with all the luxuries of the eastern world. Their fleets sailed annually from various ports in the Red Sea, coasting the Indian continent as far as Cape Comorin, opposite to which the harbours on the northern part of Ceylon afforded them ample shelter, whilst they bartered their silver for the equally precious things brought thither by the traders of the far East. The many ruins of important cities, and the vestiges of a once extensive cultivation of grain, bear testimony to the value of the early trade of this part of the island, and to the wealth of the inhabitants. The vessels which brought the silks, the ivory, and the perfumes of distant and untravelled lands to the Egyptian merchants, carried back with them to the monarchs of Hindustan, the cinnamon and pearls of Ceylon as well as the silver of Rome. The traders of Egypt also took considerable supplies of the spice, to barter along the coasts of Persia and Arabia for the produce of those countries, whence it found its way into Asia Minor and the northern kingdoms of the East; thus they were the means of its distribution over nearly the whole of the known world.

The numberless sacrifices which the Greeks and Romans were at all times accustomed to offer to their deities, as well as the profusion of costly aromatics consumed at their funerals, will easily induce us to believe that this spice was an article sought after by them at no small cost. If in those remote times it was far more costly than at present, from the long transit it made before reaching a market, we may fancy that the very dearness of it would render it more highly prized by the proud and wealthy of Rome.

From this period until the discovery of the passage round the Cape of Good Hope, the Red Sea and the Pambam passage continued to be the channel for the trade between the eastern and western worlds. From the opening of this new route, the decline of the northern ports of Ceylon and the ruin of the native fleets may be dated, the entire commerce of the East having passed into the hands of the Portuguese.

The quantity of cinnamon exported by the Portuguese was very trifling, as the spice had not then become an article of much demand in Europe. For many years much more was taken by the Arab merchants who continued to trade with the Ceylonese, than by Europeans; indeed these people took considerable quantities of the spice up to so late a period as the beginning of the present century, when cassia became its substitute with them at a much lower price; we have now lost their custom altogether.

The trade in cinnamon under the Portuguese did increase, though to but a small extent, and through them and their neighbours the Spaniards it was introduced into the new world, where at a later period the demand beame very considerable. We cannot, however, discover that the Portuguese made any progress in improving the culture of this spice, or that they ever attempted it. The energies of this people were seldom directed to the improvement of any of their extensive conquests or colonies; to discover and subdue seemed to be their only pride, and to wring the greatest quantity of wealth with the least possible exertion or trouble from their tributaries, was their sole policy. When the Dutch therefore took possession of the island, they found the trade in this valuable spice extremely limited, and the cultivation of it in about the same state that it had been from its first discovery and use. In the western province, particularly about Colombo and Negombo, the bushes were found to be more abundant and in better condition than in any other part of the island, owing rather to the lightness of the jungle around than to any care bestowed upon them.

The Dutch have ever been an industrious and persevering people, however misguided and bigoted in their commercial policy; and it was not very long before one of their governors, Falk, turned his attention to the culture of the spice. He began the experiment in his own garden, near the Mutwall River, much against the opinions and wishes of the Chalias, who had always kept matters concerning cinnamon entirely to themselves; and they now declared that the spice would deteriorate by cultivation. Falk, however, was not so easily deterred from his plans, but persevered in his labours; and after much vexatious opposition and annoyance from the native peelers, who fancied they should lose some of their employments if it were grown in abundance about Colombo, he succeeded in producing bushes superior in size and quality to any that had hitherto been known. Having been thus far fortunate, the Governor next commenced a partial cultivation of the best portions of the cinnamon land around Colombo; he employed great numbers of the neighbouring villagers and their headmen to free the bushes from low jungle, and from the thick shade of the larger forest trees, encouraging them in their exertions by the promise of honours and rewards; and in the course of a few years he had considerable tracts of land well opened, and obtained a far more abundant supply of the spice than had been previously collected.

Falk appointed a large number of watchers or lascoryns to keep cattle from the ground, and preserve the bushes from damage; severe enactments were passed against any who might cut or destroy cinnamon; heavy fines for the smallest offence, and severe punishment by public flogging for more serious depredations, were decreed: even the Modeliar and other headmen were sometimes flogged when it was discovered that any bushes had been destroyed in their districts, without the real offender being brought to punishment.

During the Dutch time, the exports of cinnamon to Europe and the Indian Continent appear to have been considerable. Ever intent on promoting their interests by peaceful and certain means, they entered into treaties with the Kandian sovereigns, by which they secured the right of purchasing annually, at a fixed rate, a large quantity of spice which was found growing most abundantly throughout the jungles of the interior. They took care to have the price fixed at as low a rate as possible, namely, about 20*s.* the bale of 88 lbs., and a good portion of this price was usually taken out in salt, which the Kandians could only procure from the maritime provinces, and in articles of European and coast produce. The greediness and oppression of the Dutch frequently led to quarrels with their Kandian neighbours; but as the latter depended entirely upon them for salt and cloths, the yearly quantity of cinnamon was nearly always forthcoming,—nor do we find that any alteration in price ever took place.

From documents in the archives at Amsterdam, it would seem that, in the middle of the eighteenth century, the quantity exported from Ceylon was, 6000 bales to Europe, 1000 or 1200 bales to the Dutch East-India Company for the Indian Continent, 400 to the Coromandel Coast, and about 200 to Persia and the coasts of the Red Sea by the Arab traders, making a total of nearly 8000 bales.

The English found the trade on the decrease, and the cultivation of the spice confined to a few spots near Colombo, the same which Falk had long before begun upon; since his time no improvements had taken place, the ground being merely kept free from jungle, whilst in many parts water had collected and formed extensive swamps. But though the Dutch had done so little to increase the crops by improved methods of culture, they had used every endeavour to preserve what already grew in the island; they had passed the most severe enactments against any who rooted up a bush of cinnamon, even from his own ground, for all alike were decreed to be the property of the Government; fines of 50 and 100 dollars were levied for first offences, and confiscation of property followed a repetition. These enactments remained unrepealed when Ceylon became a British possession, and it was not until 1833 that any but Government were allowed to cut a single stick of cinnamon on their own property.

Our countrymen having driven out the Dutch, the Kandians, who had so long looked upon them as allies and friends, began to consider us their enemies, and showed no inclination to supply us with produce. Constant quarrels arose, and the usual exchange of spice for cloth and salt never took place; the latter they seemed generally to have obtained from the north, independently of us.

Governor North soon turned his attention to an article which was likely to become of so much importance to the revenue of the island; and we accordingly find that, in 1799, he enclosed the best portions of cinnamon land at Marendhan near Colombo, and at Kaderani in the vicinity of Negombo, with broad boundary ditches; a large number of labourers was placed upon these gardens, which in a very short time were in a comparatively flourishing state. The knowledge of the English in spice cultivation was at this period very limited, and that little they derived from the Cinghalese headmen, who have been at all times ignorant and prejudiced. It was, therefore, hardly to be expected that any improved system of cultivating the spice should be commenced immediately.

It was not until 1805 that any attempt was made at improvement; at that period Mr. Carrington, the chief superintendant of the gardens, began to root up the small jungle from amongst the bushes and to remove the superabundant shade. This was found to answer well; there were, however, large tracts of vacant ground in the gardens, the soil of which was evidently well adapted to the growth of cinnamon, and these in 1806 and 1807, Mr. Carrington proposed to the Modeliars of the Mahabadde that they should plant at their own cost under promises of rewards, distinctions, and privileges. His wish was of course law to them, and they commenced the task towards the end of 1806, and during the succeeding rains of May and June, they planted the following quanties of ground:—The Maha Modeliar, 120 acres; the Wellisere Modeliar, 110 acres; the Welletotte Modeliar, 100 acres; the Roone Modeliar, 60 acres; and the Dadella Modeliar, 100 acres. They were rewarded for this with medals and titles, and the lands planted by them have ever since been known by their names. The Maha Modeliar from his great influence had the command of a far superior force of labourers: his tract was consequently the best planted and the most cared for, and is at this time the most flourishing portion of Kaderani. They planted with seedlings raised in nurseries, and in 1811, a small peeling was obtained; about 12 bales from the 490 acres. Other parts of Kaderani and also a large tract of Marendhan was planted with cinnamon roots removed from the neighbouring gardens; but these nearly all failed, doubtless from the want of care, for it is far easier to plant in this way than from the seedlings. Transplanting was persevered in during the four following years, chiefly at the Marendhan garden.

In 1808, Mr. Carrington sent in a report to Government upon the state of the gardens, both preserved and otherwise, from which it would appear that many of the latter were being cleared of cinnamon and cultivated with other produce. He recommended that these gardens should be well watched, and as a proof of their value to the Crown, ordered the next peeling to be taken from them alone, leaving the plantations for the following year, and he succeeded in obtaining a crop of 3675 bales, one-third of which was, however, no doubt spurious. His views in these matters were approved of, and greater vigilance was exerted over the gardens of individuals which contained any quantity of cinnamon. As may be supposed, however, this did not prevent the work of eradicating the obnoxious plant, now rendered more offensive than ever: it was found impossible to command a supervision over the numberless small plots of ground containing a few bushes each, more especially as any information on the subject could only come from the natives, who are well known never to give evidence of the sort except from personal motives. Had those in authority had any experience, they would have seen the futility of the attempt at watching every half dozen bushes, and instead, should have given unlimited permission for rooting up cinnamon, on condition of bringing in the roots to the plantations, where, had they been placed, they would have been safe, and have quickly yielded a large and certain return, with but little fear of their destruction. The loss from removal could not have equalled the quiet destruction carried on by the coerced owners of paltry cinnamon grounds. But these things were looked at in a far different way then; everything seemed to have been carried on in extremes, and accordingly we find that in 1810, Government, which two years before, had decided upon having every acre of village cinnamon well watched, was now on the very point of abandoning *all* their preserved plantations except Marendhan, and of forming new ones some way up the Mutwall river, to be defended from the Kandians by block-houses and fortifications, and sufficiently removed from the sea to prevent smuggling, then pretty extensively carried on. The scheme however fell to the ground, no doubt on account of another being placed at the head of this department with more enlightened views; Mr. Montgomery recommended that Government should add to their plantations, and thereby render themselves independent of both the Kandian jungles and native gardens, in which case they might gradually loosen the restrictions upon destroying the spice, and allow many tracts of good land to be profitably cultivated. The former suggestion was acted upon by the preserved gardens being more fully planted, but we find no signs of any leniency towards owners of private grounds.

Of the peelings in different years previous to 1804, there does not appear to have been any record kept, except an indistinct one in the office of the Export Warehouse Keeper. From the above year, however, we find the following stated as the crops from various sources.

YEAR.	Marendhan.	Morotto.	Ekelle.	Kaderani.	Colombo Jungle.	Galle Jungle.	TOTAL.
							Bales.
1804	1223	378	849	871	68	49	3440
1805	1153	279	561	498	68	228	2790
1806	1571	448	397	544	894	460	4315
1807	630	117	137	275	2107	1567	4837
1808	2147	345	472	1003	420	643	5032
Average...	1345	313	483	638	711	589	4083

In 1809 a different system was pursued on the recommendation of Mr. Montgomery; which was, to give the preserved plantations a respite to gain strength, by cutting them alternately with the jungles and private gardens, some portion of the latter being peeled every year.

YEAR.	Marend-han.	Morotto.	Ekelle.	Kaderani.	Colombo Jungle.	Galle Jungle.	TOTAL.
1809	—	—	—	—	2795	2851	Bales 5647
1810	2042	309	459	1161	242	357	4572
1811	—	—	—	—	2709	1699	4408
1812	2475	306	439	1102	440	150	4914
1813	—	—	—	—	2093	1346	3439
1814	2292	365	424	863	518	163	4567

The subjection of the Kandian country to British rule in 1815, enabled the peelers to enter that part of the island which had hitherto been cut only by great stealth, and very imperfectly. In the first year a large crop was carried away, not less than 9600 bales, which, when sorted, yielded about 7000 bales of good spice of second and third sorts. From this time the Kandian spice was cut alternately with the Colombo and Galle jungles, or whenever the preserved gardens fell short of the required quantity.

At this period Government employed 296 labourers regularly on the three gardens of Kaderani, Marendhan, and Morotto; the latter had only recently been put in order, and soon afterwards Ekelle was treated in the same way, but the cultivation as yet merely consisted in keeping down the tall jungle, and removing the creeping plants from about the bushes. A year or so afterwards the neglected gardens at Wellisere were cleared and cultivated in a similar manner to the other plantations. In 1819, the chief superintendant recommended that the two principal gardens of Kaderani and Marendhan should be extended by purchasing the adjoining lands of the villagers, and planting them well with seedlings from the Toonhoul, or abandoned gardens. This suggestion was not, however, acted upon until 1823, under the superintendance of the late Mr. Wallbeoff; this gentleman infused a new spirit into the system of cinnamon culture, and his ideas met with the cordial co-operation of Government. Liberal supplies were granted him by Sir J. Campbell, whose successor, Sir E. Barnes, shewed even more readiness to carry out his plans. Nine hundred men were employed in the new works. Large drains were opened throughout Kaderani, and about 645 acres of new ground were planted; nearly the whole of the plantation was rooted and weeded, and freed from the shade of forest trees, except so many as were necessary. This work continued until 1828, when the force was reduced, and in five years afterwards, 1833, the trade being thrown open, none but a few Lascoryns were kept on to watch the properties.

The false economy of this sudden change was shewn by the wretched prices for which nearly all the gardens were sold in 1841, 1842, and 1843, chiefly consequent on their neglected state, though of course the then state of the spice trade had not a little to do with this. So totally had these fine properties been neglected since 1833, and such had been the rapid growth of the jungle trees, that at the period of sale there were hundreds of acres on which not a vestige of a cinnamon bush was to be traced; nothing but one dense mass of underwood below, with wide spreading forest trees shutting out the fresh air and light from above, was to be met with on almost every side; the only exceptions were small favoured patches near the roads and bungalows. Nearly all the drains opened by Government, at a large outlay, had become filled up by constant washing in of sand, and the consequence was, that large tracts of what had been but recently fertile spots were converted into bogs and swamps; and the bushes, covered for two-thirds of the year with water, ceased to put forth fresh shoots. Government, however, continued to peel their gardens up to the time of sale, getting of course less every year, as well as spice of a coarser description. Their last cutting took place in 1841, at Kaderani and at Marendhan, but they obtained very little of the finer qualities, and the low price of the article at the time offered no inducement to bestow particular pains upon the preparation of it.

The spice brought in from 1815 to 1821, varied from 4000 to 7000 bales per annum, a good deal of which was rejected on assortment. The plantations continued to be peeled every second year, alternately with the jungles and private gardens.

From 1822 to 1831, the average peelings of the five preserved gardens was as follows:

From Marendhan,	containing	3794	acres,	1518	bales.
From Kaderani	„	5139	„	1096	„
From Morotto	„	1431	„	309	„
From Ekelle	„	1012	„	447	„
From Wellisere	„	667	„	86	„

After this period the gardens appear to have been cut every year, and to have received less care than previously, no doubt from a knowledge of the opening of the trade which was so soon to take place. The crops fell off by about 25 per cent. in a very short time, and in 1833, the peelings on account of Government, amounted to no more than 1670 bales.

The ten years which followed witnessed some unprecedented changes in the state of this trade; up to the present period the Government had exported the whole of the cinnamon peeled for sale on their own account; it was illegal to deal in the article, as also to cut a stick, though growing in private grounds. But in 1833 the monopoly received the first blow; the Ceylon Government received instructions to dispose of their gardens and of their stock of spice on hand in such a way as should appear most advantageous; the sale of the latter to take place in the island, so that the merchants at last derived some benefit from it. The Ceylon stock of spice at this time amounted to 11,000 bales, and Government commenced by putting up 1000 bales monthly, at the following upset prices: for first quality *3s. 6d.*, for second quality *2s.*, and for third quality *9d.*, upon the exportation of which *3s.* per pound duty was to be paid. Parties possessing cinnamon bushes in their gardens were allowed to peel them and sell the produce, which, however, was obliged to be assorted in the Government sorting establishment at fixed rates. A further concession was made at this time to persons having not more than fifty bushes or trees in their grounds, who were allowed to remove them and cultivate the land; of this permission great numbers availed themselves. In 1836 the quantity offered for sale monthly was reduced to 410 bales, the export duty being at the same time fixed at 2*s.* 6*d.* for first and second qualities, and 2*s.* for thirds.

The following table shows the yearly quantities of private grown spice approved of by Government, with the total exports of cinnamon, and the prices ruling at home during those periods:—

	Private Spice Exported.	Exports of all kinds.	Average Prices at home of Government Spice.		
Year.	Bales.	Bales.	First.	Second.	Third.
1834	2863	—	10*s.* 0*d.*	9*s.* 0*d.*	6*s.* 6*d.*
1835	1180	—	9 0	8 9	6 0
1836	1822	7293	9 0	8 0	5 0
1837	1579	6083	7 10	7 0	5 6
1838	1349	4443	8 6	6 9	5 6
1839	—	5321	7 6	6 0	4 9
1840	—	3372	7 3	6 0	4 6
1841	—	3056	7 9	6 0	4 2
1842	—	1117	7 0	6 6	5 0
1843	—	6522	6 6	5 6	4 3
1844 to August 31		6572			

From these data we perceive, that although the opening of the trade to private dealers was a step which gave a stimulus to exports at the time, and threw the operations in the spice into their legitimate channel, yet the good effects were not permanent, and even the *reduction of* export duty in 1836 failed to call forth any increased activity in demand. Consumers of our Ceylon cinnamon began to find the article too costly for their means, and that another product might be substituted for it at a tithe of its price. Cassia consequently rose rapidly into demand, and has continued to the present time to supplant cinnamon in many of the Continental markets as well as in our own.

Although the Home Authorities had in 1832 instructed our Colonial Government to free itself entirely from the trade in and the cultivation of this spice, nothing was done towards effecting the latter until 1840. A beginning was certainly made before this time by advertizing the Toonhoul, or abandoned gardens, tracts of land which had been planted with cinnamon by natives for the Government, but which had never been well cultivated, and had been for some years left to their fate. From 1834 to 1839 about 2000 acres of these lands were sold at prices varying from 10*s.* to 12*l.* the acre. A great part of these were no longer retained for cinnamon; the laws against rooting up the spice being no longer in force, the purchasers destroyed a vast number of bushes, and if we add to these the number rooted up by permits in private gardens, and those eradicated at a more recent date by coffee planters in the interior, we may be able to form some idea of the extent to which the production was becoming limited.

After 1833 Government, of course, ceased to cut from jungles or other than their own gardens. Their peelings from the five plantations for the following eight years were thus :—

For 1833	1631 Bales
1834	2470 „
1835	No peeling
1836	5349 Bales
1837	2524 „
1838	2312 „
1839	2210 „
1840	1795 „

which was a great falling off from previous years' crops. Morotto and Ekelle were sold in 1840 and 1841, so that in the latter year only 900 bales were peeled by Government, and this was the last spice ever cut by them, for before the crop time of 1842, the rest of their gardens were sold, except Marendhan.

Before putting up these properties to auction, tenders were received by private parties wishing to purchase them. Amongst the offers made were 500*l.* for Ekelle, or 10*s.* per acre; 1000*l.* for Kaderani, or 4*s.* per acre; and 40*l.* for Wellisere of 600 acres, whilst a Modeliar of the Mahabadde, better acquainted with their real value, offered

15,000*l.* for all the gardens, which was at the rate of 1*l.* 5*s.* per acre, and about the figure at which most of them afterwards sold.

From this time until the close of 1843, the trade languished, in spite of the great alteration which took place in May of that year, viz., the reduction of the export duty on cinnamon to 1*s.*, and the sale of the Government spice at whatever it would fetch, by 200 bales per month. In May and June, 1843, the shipments of spice under the low duty were exceedingly large, so much so, that many expected the supplies would knock down prices at home, lower than they had ever been, and in consequence, Government obtained very little for their monthly lots. Early in 1844, however, folks began to perceive that stocks had been gradually decreasing, and that after the large imports at home of low duty spice, the quantity on hand was hardly sufficient for a six months' consumption; this and the fact that the Ceylon Government was getting near the end of its stock, gave buyers on this side renewed confidence; prices got up about 50 per cent. in a very short time, and it is thought that the whole of the cinnamon on hand here will go off at these improved rates.

The Mahabadde is the name applied generally to all who are by caste or profession connected with the cultivation and care of cinnamon, but especially to the Modeliars and other headmen of the caste; the common appellation of Chalias being far too insignificant for them, and applied only to those in the inferior grades. The literal meaning of the term Mahabadde, is "Great Tax," and it was used in consequence of the Dutch having compelled every village of Chalias to bring in a certain quantity of cinnamon by way of tax. This caste like all others has a great number of grades and ranks within it; the highest is that of the Maha Modeliar, or principal headman; then follows the Maha Vidahn Modeliar, the Modeliars, Mohandirams, Aratchies, and Canghanies. The number of individuals composing this caste, varies at different times, but it has generally been from 6000 to 7000. The Mahabadde is divided into four principal classes, which again have their sub-divisions, and these four are, 1st, headmen; 2nd, lascoryns, or watchers; 3rd, peelers, who prepare the spice, and 4th, cinnamon coolies; none of these can rise to the grade above them.

The Chalias, or men of the Mahabadde have from the earliest times resided in particular districts, stretching from Negombo in the Western Province, to Tangalle on the East Coast of the Island, and this extent of country has for convenience been divided into six districts, each having a first and second Modeliar, with the Maha Modeliar over the whole. In 1824, the number of peelers in the caste was 3571; in 1833 it was 3119; and at present they do not amount to more than about 2500. The Maha Modeliarship was an honorary office, and has not been filled for some years. The first Modeliar of each district receives his instructions and orders direct from the Government Agent of the Province, and he, through the Mohandirams and Aratchies, disseminates the wishes of Government, and collects the requisite number of peelers at the season for cutting the cinnamon crops.

During the system of compulsory labour, every district was obliged to furnish a certain quantity of spice at a low rate given in cloth, rice, salt, and a little money, the quantity being regulated, rather by the number of peelers in the district than by the bushes growing there, and for this the Modeliars were held responsible.

The Dutch gave the headmen no salary, but allowed the Modeliars to exact from every peeler and cooly employed by the Government one pice or one half farthing a-day: the Mohandirams received a challie or half a farthing, and the others in proportion; so that during the harvest time their emoluments must have been considerable, and it was of course to their interest to have as many labourers employed as possible.

The Modeliars of the Mahabadde had far more power than any other headmen, for until of late years, no one but themselves knew any thing of the cultivation and preparation of the spice, consequently no operations were commenced, without the matter being first referred to them by Government. It was clearly to their interest to keep all information in their own hands, and enlighten their European masters as little as possible, whilst on the other hand, the superintendants cared little for the details of their department so long as the required quantities of spice came in. The time for commencing peeling the bushes, the quantity to be got from each district, the number of people to be employed, were all points left to the decision of the Modeliars; the Government merely intimating the gross quantity they required for the season; and this quantity had reference to the state of the European markets, or perhaps to the condition of their revenue, and their consequent ability to pay the peelers, rather than to the capabilities of the cinnamon districts to afford it. In later times, if the plantations and jungles of the Western and Southern Provinces failed to yield the usual number of bales, the peelers were driven like sheep further up the country, and spread themselves through the seven Korles and the Central Province, whence the wild spice was brought to make up the desired quantity.

When forced labour was abolished by the British the peelers received *3d.* in money, and two-thirds of a seer of rice per day, with a seer of salt per month; for this pay they were expected to deliver from 80 to 100 pounds per month, when cutting in the preserved gardens or the jungles about Colombo or Galle. In 1829, the system was altered, and the labourers were paid according to the quantity and quality delivered, viz., for each pound of first or second quality, *3d.*, and for each pound of third quality, 1½*d.*, the allowance of salt and rice being discontinued. In 1830, the rate for the fine qualities was raised to 3¾*d.* per pound, after many complaints from the Chalias, and this was again raised to *4d.*, in 1833. In the following year they succeeded in obtaining *5d.* for the fine sorts, and 2½*d.* for the thirds; and these were made *5d.* and 4½*d.* in 1836. In 1837, they were paid still higher, viz., 5½*d.* for first sort, *5d.* for second sort, and 4½*d.* for thirds; since that period the pay has decreased and peelers now receive 4½*d.* per pound on all qualities. An active Chalia with the aid of his wife will easily prepare 100 pounds of good cinnamon in a month, and this at 4½*d.* the pound, will give him 1*l.* 17*s.* 6*d.* or about 7*l.* for the season of four months, a very handsome earning for men having so few wants to satisfy, and altogether at variance with Miss Martineau's statements, regarding the wretched poverty of these people in her tale of "Cinnamon and Pearls." As is generally the case with those who earn money rapidly at certain seasons, the Chalias are very improvident and of dissolute habits, being generally in debt to the headmen of their districts, who consequently have a claim on their services.

The Mahabadde enjoyed several privileges under the Dutch and the early British Governments, which no longer exist. One of these was exemption from tolls; another was that no Chalia man could be tried for any offence, unless by the superintendant of the cinnamon department; these and several minor privileges have been gradually limited, and at length altogether abolished.

The proper peeling season is from May to August inclusive, the mild showery weather of those months greatly favouring the operation. Peeling is, however, frequently carried on in November and December, and some proprietors of small gardens who may be anxious to realize their crops, will not hesitate to cut at any season of the year, however prejudicial it may be to their properties as well as to the spice cut.

Cinnamon peeled during very dry weather becomes of a dark colour, and will not form compact quills. There are few products so delicate as cinnamon, or requiring so much care and attention from its earliest stage, until it be placed on board ship. It is easily broken if roughly handled, and is extremely susceptible of mouldiness, whence the practice in former days of packing it amongst pepper, the absorbent qualities of which prevented any injury likely to arise from dampness.

ART. XXIII.—*Reports on the Manchur Lake, and Aral and Narra Rivers, by* CAPTAIN POSTANS, *and* R. C. KNIGHT, ESQ., *communicated by* CAPTAIN POSTANS.

(*Read June* 15, 1844.)

AT a period when every geographical feature of the river Indus and its outlets or tributaries may be considered of interest, the following reports on that peculiar branch called the Narra, which, leaving the main stream on the western bank, a little below Sukkur, debouches at Sehwan, are offered for consideration. The first of these reports was drawn up by the author, in consequence of his being one of the first Europeans who had pursued this route; and the second by the assistant-surgeon attached to the steamer, which was sent experimentally to test its value in avoiding the delays and strong currents of the main stream during certain portions of the year; the result was so far satisfactory, that with a well adapted boat it is evident the voyage over this distance might be made in about sixty hours, or one-third of the time consumed on the river itself. The great feature and natural curiosity of this portion of the Indus, however, is the great lake Manchur, an expanse of waste water of the mighty Indus, which is formed by the main streams rushing into it from north and east, and which is probably 200 square miles in extent. The greater portion of the surface of this lake is covered with the lotus plant, in all its beauty and luxuriance, and it is perhaps impossible to imagine a more delightful voyage than across this magnificent expanse of water, the scene being much enlivened by the great number of fishing boats; a considerable portion of the poorer Sindhian population finding their homes and subsistence in this locality. The quantity of water-fowl on the lake Manchur exceeds belief, and the method adapted for entrapping them by the poorer natives is curious; a certain number of common chatty pots are in the first place allowed to float on the surface of the lake, baited with grain; when the birds have become perfectly familiarized with these, the fowler himself puts a similar one on his own head and descends into the water up to his chin, where he remains perfectly motionless; the birds then attempt to take the grain, and are ensnared by a small net thrown over them: in this great numbers are taken and used as food.

The name applied to this lake, "Manchur," may possibly have some connection with "Mansura," which according to the reports of Edrisi and Abul Fazil, should have been somewhere in this

locality; the Narra, it is well known, contributes with the main stream to form that particularly rich portion of Sindh, called the Chandkoh District, which by the Greek historians was known as Prasiana, or the verdant, and which was to the Amirs the most profitable of their landed possessions. Ahmed Khan Laghari, the celebrated vizir, held rich and important jaghirs here. I may conclude these remarks by observing that the late head of the Government of India was pleased to attach great importance to this route as a means of saving time in the intricate Indus navigation; and it should, there can be no doubt, be the subject of still farther inquiry and exertion, now that all connected with that magnificent though much over-rated stream, (I speak as to navigable facilities, and, therefore, commercial value,) is likely to be of vital importance to the British Government, and when steam is intended to be carried out on an extensive scale.

REPORT OF CAPTAIN POSTANS.

During a certain portion of the year the main stream of the Indus from Sehwan to within a few miles below Sukkur, is abandoned by the Indus boatmen, who, from April to September, invariably pursue the more circuitous but easier route by way of the Aral and Narra rivers, and the great Lake Manchur. As the result of my observations whilst travelling in this direction led to the conviction, that it offers unusual advantages for steamers of even moderate powers, I have drawn up the following brief notice, with a view to call attention to the subject.

The great stream of the Indus, meeting the formidable opposition offered to its current, by the hills which join the river a few miles below Sehwan, throws off a branch in a westerly direction towards that town, and during the height of the inundations, and consequent greatest velocity of the current, this branch is continued up the Aral river to the distance of nearly twenty miles[1], until it is lost in the waters of the great lake Manchur. The Aral river may be said to commence immediately above Sehwan, from the main river to the town; it is a broad open channel, but its general width above is probably about forty yards, very uniform, and its depth every where very great; the banks are low, even with the water's edge, with but little cultivation, and are clothed with thick jungle of the tamarisk bush, which here, as elsewhere in Sindh, often attains the size of a jungle tree. The course of the Aral is very straight; the circumstance I have mentioned of the stream from the main river traversing *upwards* in the Aral, as far as its junction with the lake, occurs, I have reason to think, during only a limited period, since a fleet of boats pursuing this route in the month of May last found the clear water of the Aral issuing from the lake, to within a short distance of Sehwan, when the current from the main stream ceased to be in their favour. In the beginning of July, however, which was the period of my journeying in this direction, the contrary was the case; we were carried *with the stream* from the Indus up the whole distance of the Aral; the muddy water being observable even for some time after we entered the lake. I mention the above fact with the view of demonstrating the great increase in the velocity of the main stream, during the height of the inundations. The great Lake Manchur, when swelled by the inundations, is an enormous expanse of water, said to be 20 miles in length, by some 10 in breadth, and covering an area probably of about 200 square miles; it extends from the foot of the hills to the west, and is lost in the low lands to the eastward; the ordinary channel for navigation is nearly in the centre, where the water is beautifully clear and very deep. It would appear that the same facilities for traversing its waters, which were observable when I crossed the lake, would always exist, since its main body is not affected by the inundations; these appear to be spread over the low lands and to leave the centre of the same depth, or nearly so, throughout the year; the Aral and Narra rivers, however, are completely dry from November to April. The traffic of boats upon it occupied in fishing or transporting grain appeared to be very great. The surface of the lake is covered for miles with the lotus plant; it abounds in fish, and whole families, as in the great river, find their homes in small craft, and look for subsistence to the produce of their nets. The Narra has its mouth in about the centre of the northern shore of the lake; the channel for some distance is confined, and passes through a dense jungle of the tamarisk, but the appearance of the country soon changes, and, for the greater part of its course, this stream flows through an open land, which will probably vie with any of the same extent in the East for richness of soil and capabilities of fertility. The general breadth of the Narra I should calculate at from 80 to 100 yards, and the average rate of current probably 2 miles, as conjectured; its depth close to the banks was generally 20 feet. The term "Narra," signifying in vulgar Sindee a snake[1], is well applied to the continued windings of the stream; but these, from the dulness of the current, offer no obstacle to navigation, even at the height of the floods: a boat of forty Khumars was tracked by five men at the average rate of sixteen miles a-day. The distance from Sehwan to where the Narra issues from the main stream is estimated by the natives at 200 miles, 100 koss, or about double that of the river itself, and I should not think it overrated. The general effect of this river is of its being a canal; it is difficult to imagine that its course is not artificial. The portion of the country lying between the Narra and the main stream has, of course, a double advantage of irrigation, and as the lands lie generally lower than the Narra, a simple drain suffices to turn the waters upon them. The soil is a rich alluvial, and rice is the principal cultivation, though the cotton plant, of the large description peculiar to Sindh, is seen in great perfection on the higher banks. This portion of Sindh, is more thickly populated than most others; villages abound on both sides the river, many of them wattled, or composed of huts built of temporary materials, surrounded by numerous flocks of sheep and cattle, the latter of an exceedingly fine description. There are also several towns of size and importance, the principal being Khyrpoor. The numerous Government boats laden with grain, which I learnt were on their way to Hyderabad, attest the importance of the revenue derived by the Amirs from the rich territory; at the same time, their usual system of excess in taxation is doubtless the cause of the comparatively small portion of land under cultivation, in districts which might be made productive to an almost unlimited extent.

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[1] All distances merely conjectured.

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[1] I am not quite sure if this term is correct, but the natives to whom I applied so designated it; many other tortuous streams in Sindh bear the same appellation.

As I journeyed by the Narra River during the most favourable season for navigation, I may be overrating the advantages which it presents as a general route, but I think there can be little doubt that for six months in the year it would offer the advantage over the main stream of slow current, a uniform and great depth of water, with abundant supplies, not forgetting the important article of fuel; and as such may, perhaps, merit a survey and detailed report.

Report of R. C. Knight, Esq.

On the morning of the 19th June last [1841] we left Sehwan in the Honourable Company's iron steamer "Meteor," and proceeded through the Aral river towards Lake Manchur, and arrived at the spot where the river joins the lake in one hour and ten minutes from the time of starting. At this period, the current of the Aral was setting *westward into the lake*, at the rate of one mile and a half per hour.

This river branches off from a large ramification of the Indus close by Sehwan. During the period of the inundation, the water of the Indus, rising above the level of Lake Manchur, regurgitates up this river into the lake, establishing a westerly current, until the main river begins to subside, when, the lake being now the higher, an easterly reflux takes place through the Aral. Like all the rivers in Sindh that I have seen, the borders of the Aral present the same general appearance, namely, they are skirted with the tamarisk, unless where it gives place to patches of cultivation, of which the northern banks shewed more marks than the southern. Its breadth is from 120 to 140[1] feet, average depth of the fair channel from 15 to 18 feet; and, judging from the appearance of the banks, the water seemed to have risen to within a foot, or nearly so, of its greatest height. The channel winds considerably, but is perfectly clear of all obstructions; its average course is nearly due east and west, and the distance from Sehwan to where it enters the lake is 10 or 11 miles.

Steering into the lake in a westerly direction for a short distance, and gradually hauling up to north-west, with variable soundings of from 3 to 8 feet, we entered, about four miles from the Aral, the fair channel, which winds through a huge field of lotus plants, that cover the surface of the lake for miles, intermingled with clumps of long reeds and rushes. This channel, at the time we passed through, was from 12 to 14 feet deep, general breadth from 35 to 45 feet, and it is as well marked as any channel can be,—the lotus leaves floating on the surface of the water on each hand marking it as accurately as if a line of buoys had been laid down for the purpose. It appears to be in the very centre of the lake, traversing it in a north-westerly direction; and when we passed through the water was still, or at least, there was no appreciable current. The stillness of the water and the non-existence of lotus in this channel, may be accounted for from the fact that the Aral at one end of the lake and the Narra River at the other, pouring their waters simultaneously into its basin, must at length neutralize any pre-existing current; but, when the main river subsides, and the waters of the lake once more flow through the Aral, a current must doubtless take place in this channel, thus keeping it clear of the lotus, and so disturbing the plant as to prevent its taking root.

We passed two or three large cargo boats lying here, and several fishermen with their families were observed here and there, following their occupation in small boats, which glided about over this great lotus field.

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[1] This is not from actual measurement, but merely on estimation.

About an hour and three-quarters' steaming carried us out of this channel into clear water, having patches of a small plant like common sea-weed floating under its surface. Depth of water from 6 to 7 feet, gradually deepening to 10 and 12. In one hour from the time of leaving the lotus field we had crossed the lake and reached the clumps of long reeds and grass which line its northern and eastern borders; the whole having the appearance of a large marsh with openings at intervals sufficient to admit boats of small burden[1]. Steering along the verge of this mass of reeds and grass, gradually hauling up in a north-westerly direction, in one hour more we arrived at the entrance of the Narra, which is here a rapid muddy stream, about 40 feet broad and 6 feet deep, obscured[2] and impeded by large clumps of long grass, and elephant reed. It is very tortuous, and sets into the lake from the north-east. The velocity of the current at this time was 3 miles per hour.

The above-mentioned obstructions could be easily cleared away, and a good fair way opened at very little cost; meanwhile, so dense are those clumps of reeds, &c., that even native boatmen, as I have been informed, sometimes have a difficulty in finding the mouth of the river. In consequence of the winding of the stream, the eddies and shallows, and no doubt the peculiar build of the vessel, she answered her helm so badly that she went bumping along against the banks right and left, at short distances, unless it was when we occasionally got into a long straight reach. In shallow water her helm was nearly useless.

As we proceeded up, the river gradually widened to 70 and at some places to more than 100 feet, the lead giving on an average from 6 to 11 feet depth of water; the banks became clearer of jungle, and the country also more open; stretching away in level alluvial plains. Villages, or collections of herdsmen's huts built of wattles and other temporary materials, were spread over the country, but more particularly close by the river. There were flocks of buffaloes here and there; and sheep of most excellent quality, and goats, seemed abundant.

About 8 miles above a large town, on the left bank of the river, named Mír Mahomed Shírah, the stream divides into two branches, the one to the north-half-east, the other to the north-east-by-east. The latter branch, which is called by the natives the "Kutár," we found to be the proper channel[1], but obstructed about 4 miles above its mouth by a large bund thrown across, near a village called "Chunnah," as well as another 3 or 4 miles further up, opposite a village named "Gaha;" about mid-way between these were the remains of an old bund, which gave us considerable trouble in consequence of the narrowness of the opening.

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[1] Here we met nine small cargo boats laden with grain.

[2] So obscured was it, that we took on board a fisherman, whom we found at hand, to act as pilot. By his direction we came to the mouth of the river, about 200 yards only above the place where we took him on board.

The "Kutár" is about 5 feet broad at the entrance and 5 feet deep; it contracts a little as you proceed up towards the bund at "Chunnah," but before reaching that spot, it expands to about 100 feet in width; its average depth throughout is from 5 to 8 feet. For 2 or 3 miles up from its mouth this channel is beautifully picturesque; its margin is overhung with tamarisk trees, creepers, and underwood, which line it to the water's edge, and its right bank is studded for some distance inland, with babool trees of great size.

On arranging with the native authorities labourers were set to work, and an opening of about 32 or 33 feet wide in each of the above-mentioned bunds was soon effected. The upper or largest bund is, as before observed, close to "Gaha," a village situated on the right bank of the Narra, among dates, tamarisk, and barr trees of a large size, on a rising ground which forms the angle made by the Narra and Kutár. The bund crosses the latter stream in a north-westerly and south-easterly direction, shutting off the waters of the Narra, which at this place is a fine river, 104[2] feet broad, and 8½ feet deep, with a current setting south-easterly, at the rate of 2 miles per hour. Here all our difficulties were at an end.

This river, though exceedingly tortuous[3], maintains nearly the same breadth as given above, contracting and expanding here and there; whilst the depth amounted from one fathom to sometimes three and a half.

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[1] One mile and a half above Mír Mahomed Shírah, a branch, called the "Giddur," debouches into the main stream from the north-north-east. It averages from 18 to 26 feet broad for about 3 miles above its mouth, and then, according to the native account, expands into a broad stream of about 100 feet; some segments of the paddles were taken off, and angles of the banks cut away, for the purpose of tracking the vessel up to the broad part of the stream; but after proceeding up about 200 yards, we were obliged to abandon the attempt, after three days' hard labour. The "Giddur" would seem to be the branch taken by the native boats to get into the main stream above, when the bunds in the "Kutár" are up and entire; and I am inclined to believe this, because, though comparatively narrow at its mouth, it is of considerable depth, about 9 feet mid-channel, with a current running at the rate of 2½ miles per hour.

[2] By actual admeasurement.

[3] The first day, in the course of our passage up from the bund of "Gaha," the vessel's head was five times on every point of the compass, so winding is the course of the stream.

The vessel now answered her helm pretty well, excepting occasionally at sharp turnings of the river, when her bow was caught in the strength of the current. From Lake Manchur up to the bund of "Gaha," the country appears but moderately well cultivated, and the inhabitants seemed wretchedly poor, if we may judge from their general appearance, which had not the clean substantial aspect of those who reside higher up the river. Along the banks of the Narra, or main stream, from "Gaha" to where it joins the Indus, are many well-built large villages interspersed with those of the less permanent materials above mentioned; water-wheels in full working order are fixed at longer or shorter intervals on each side of the river; but though the cultivated lands had a very refreshing appearance and looked vigorous, it was easy to perceive from the tamarisk, milk-bushes, &c., left growing here and there in full strength in the midst of the crops, that cultivation is performed in a very slovenly style; various kinds of trees of great size grow on all sides, and would yield plenty of timber for the construction of water-wheels and other agricultural purposes,—large droves of water buffaloes were passed at frequent intervals. Droves of cows, flocks of excellent sheep, and goats, were seen scattered over the country; the chief articles of cultivation at the time we passed through, and those principally close along the margin of the stream, were cotton, sugar, and rice.

On the main stream, that is, between "Gaha" and the Indus-mouth of the Narra, there appears considerable traffic; we passed boats of various sizes, some lying near the different villages, others proceeding down the river laden with grain and fodder, and the people in apparently better plight than their brethren lower down the river, near the Manchur; they showed fewer signs of poverty, and pestered us less with begging.

In consequence of the vessels steering so badly in that part of the river between the Manchur Lake and the "Kutár," it is difficult to form an estimate of the distance, but I am inclined to reckon it about 60 miles, *i. e.*, from the lake to the bund of "Gaha."

From the latter place to the Indus, the vessel was under steam for 63 hours. The first 40 hours, average strength of current against us, 2 miles per hour; next 15 hours, current against us, 3 miles per hour; next 8 hours, current against us, 4 miles per hour; and assuming 7 miles per hour as the average speed of the vessel, we thus have the average distance from the village of "Gaha," to where the Narra joins the Indus, 28 miles below Sukkur, 284 miles. I calculate that a vessel of the same horse-power as the "Meteor," viz., 24 horse-power, did she but steer well, might make the passage from Sehwan, through the Narra, to the Indus, during the months when the river is high, in about 80 hours' steaming, exclusive of the time consumed in taking in fuel. Thus, from Sehwan to the "Manchur" mouth of the Narra 5 hours, from Lake Manchur to "Gaha" 12 hours, and from "Gaha" to the Indus 63 hours.

A steamer to ply successfully on the Narra should, I think, not be more than 80 feet in length and 16 or 17 feet broad, measuring from the external rings of the paddles; draught from 2½ to 3 feet, *and she must steer well in shallows, and obey her helm quickly in her own draught of water.* Plenty of fuel could be had, particularly about the upper part of the river. To native crafts or boats of any description, the navigation is remarkably easy and perfectly safe, the water being quite smooth, and the average strength of current not very great, except near to where the Narra joins the Indus. They pull along with ease or track when the jungle on the banks permits it; or take advantage of breezes when they can; and though the turnings and windings of the river are often sharp, yet the currents which sweep round them bear no comparison to those in the Indus, which render the navigation there both tedious and dangerous.

Art. XXIV.—*On the traces of Feudalism in India, and the condition of Lands now in a comparative state of Agricultural Infancy. By the late* Augustus Prinsep, Esq.

A large continent like that which is embraced by the name of India, must contain tracts of country in very different stages of cultivation; and at any given time examples might perhaps be pointed out of every progressive change, through which oriental prosperity is advancing. If then, it be an object to obtain some idea of the original state of agricultural rights and habits where history is confused and tradition silent, an observation of those provinces, which are in the less advanced stages of civilization, seems to be the only channel of intelligence that is open. A dependence upon such a means of knowledge, with regard to the progress of society and wealth in European nations, might lead indeed to very mistaken conjectures; but in Hindustan there are many circumstances which render this process, though always to a certain degree fallacious, still comparatively less unsafe. Indian agriculture, as a practical science, is still in a very rude state, and notwithstanding the seventy years of our dominion, remains as one of the departments little benefited by British example or power. To this condition the hereditary prejudices of the Hindús, to whom conquest brought no instruction in the practical sciences[1], and the dearth of inter-communication with natives more advanced, have mainly contributed; and although we cannot exactly say that waste lands are brought into cultivation now, in the same manner that they used to be before the Brahmanical Institutions, we may yet safely look towards the most retired and least populated provinces, for the best exemplification within reach, of primitive society in India.

It is a most natural supposition that plains, in the earliest stages of society, were inhabited before hills. Whatever may have been their mode of life, whether they supported themselves by hunting or by breeding cattle, or whether they cleared the ground and tilled it, the first communities must have found greater facilities in the level than in the hilly lands. Accordingly, in all countries we find that mountainous territories are the last that are brought into cultivation;

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[1] The Emperor Baber, in his Memoirs, describes several agricultural practices, especially the mode of irrigation, which exactly correspond with the means now in use.

partly from the greater obstacles inherent in the soil, and partly from the greater difficulties of carriage communication. Without pausing to examine the truth of this principle generally, India presents a remarkable example of the fact: for in the several districts which spread through the various ranges of hills, the degrees of civilization are far below that which the plains of Hindustan have attained. These less populous tracts of country contain tribes of people, whose characteristics differ radically from the Hindú; and there is great reason to believe that they have sprung from some separate original stock of the peninsula. But whether that stock were driven from the plains by invading foreigners, or whether a portion of it separated itself from the rest before, or at the time that the Vedas and Puranas were changing the minds of the multitude, it were vain now to endeavour to trace. Whatever scheme our imaginations may devise for the origin of mankind, we cannot easily conceive, that any community would settle on the mountains, or even in the stony valleys between them, so long as there were plains within the reach of their observation. From every reflection we must conclude, that the flow of population is contrary to that of rivers, from the low lands to the heights. If then, in the very centre of the continent, we find at the present day many tribes of men savage in comparison with their neighbours, unimbued with any of the ideas of Hinduism, and regarded as outcasts by that religion, it is more rational to suppose, that they have been driven to their present haunts on the hills, by the pressure of an adverse population overspreading the rich plains they first occupied, than that they have passed through these plains from countries still beyond in order to select the hills for settlement.

But it is less to speak of these singular tribes, whose customs and habits are of the rudest kind, than to notice the progress of Hindu civilization as it approaches the hills of India, that I have adverted to them. If the position that I have laid down be plausible, we may perhaps, by closely examining the structure of the agricultural societies in some of these retired parts of India, obtain some insight into the tenures of land and proprietary rights, as they arose out of the earliest occupation of the soil. Into many of the less accessible districts, the Mahommedan power can scarcely be said to have actually extended; the stations of the Faujdar and of the Dewan (the magisterial and fiscal authorities) were distant; as long as some tribute was paid from them, the lands in the jungles were left unsurveyed, and no military follower of the Emperor or of the Nawabs, considered a jagir of hill and forest as a worthy compensation for his service. We thence find, that all the villages and estates of these parts, with few or no exceptions, and even almost all the inferior tenures, are in the hands of ancient Hindú families, or of the mountain race of men, of whom I have already spoken; so that a comparatively infant condition of society, in no way amalgamated with Mahommedan institutions, will be presented to our view.

The province of Lower Behar, as at present divided, contains a considerable extent of that range of hills that runs across the greater portion of Hindustan from the Ganges to Malwa and Gujarat. This line of mountainous country has long been known to be peopled by various tribes, whose origin, whose difference from each other, and whose absolute alienation from the Hindús, have been matters of curiosity, and are as yet a mystery to all researchers. The press of population upon the adjoining plains has driven multitudes of Hindú families to settle by force, or by sufferance, in these yet uncultivated pergunnahs; and many of these emigrations are sufficiently recent for the local authorities to obtain a tolerable account of the origin and progress of the settlers in their new position. Of some instances I propose to give a brief sketch; the facts have been collected by personal acquaintance with the country, and I was induced to observe the customs of this district with attention, from a belief that a similarity with the early practices of India might be discovered, and if discovered, might be useful to those who may have to guide our future territorial policy.

At the beginning of the seventeenth century, or a little more than two hundred years ago, a scion of one of the families of the Bhojpoor Raja, whose estates lay near Rhotas[1] in Shahabad, being urged by the spirit of adventure, and probably discontented with his subdivided heritage, proclaimed his intention of seeking lands above the Gháts, or beyond the range of hills that rose on the south side of the river Soane, and invited followers to join in the undertaking. Some thousands of Rajputs collected round the standard raised by Bhugwunt Roy, who (in the year 1021 Fasli, 1613 A.D., as the tradition of the pergunnah fixes the date) led his army into that part of Ramgurh which has been ever since, and was perhaps before called Palamow. One encounter with the inhabitants was sufficient to insure the conquest of the country, which, containing several cultivable, and some already cultivated plains between the lines of hills, became a valuable prey to a multitude in search of a vacant territory. The chief of the invaders, assuming territorial dominion, proceeded to divide the lands of the pergunnah between himself and his followers, who, increasing in numbers as the fame of his success spread abroad, took possession of all existing villages, to the exclusion of their former occupants. The revolution has been so complete, that at the present day the original and wilder inhabitants of the pergunnah are found to have no fixed interest or property in the soil, and earn a livelihood only by slavery and hired labour.

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[1] The event here related occurred shortly after the destruction of the *Rhotas Raj* by *Sher Khan*.

The distribution of lands made by the Rajput invaders so singularly resembles those partitions described to have taken place amongst the Teutonic conquerors of the Roman empire, that a minute detail of the tenures might well be taken for a chapter in the History of Europe. The Raja, reserving to himself considerable tracts of lands, though not constituting together the greater portion of the whole, proceeded to invest (and much ceremony accompanied the investiture), first his dewan and principal officers with large estates, composed of villages already known, and waste lands to be brought into cultivation; then his friends and favourites with smaller lots; and finally every Chiru or Rajput sirdar received a village, or a space of land to make one. As with the invaders of Italy and Gaul, this distribution of the country amongst the victorious army was not entirely matter of gratuitous remuneration on the part of the chief, but every person who joined in the expedition considered himself entitled to a share of the spoils; and even at this day the descendants of the spoilers, if asked to state the origin of their tenure, will boldly say, that the lands were won by the swords of the Chirus, in association with Bhugwunt Roy, who but for them had made no conquest[1]. The villages and estates thus allotted remained, however, in the hands of their holders, as military fiefs, emanating from the Raja, not being hereditary or transferable without the *royal* permission; and a condition of military attendance, with a certain number of followers when required, was attached to the grant; the rent[2] of the lands payable to the chief was settled, where there was any stipulated, at a low rate. After this first division of territory, the Raja continued to pay all services, and reward all friends, in a similar way: villages were granted in lieu of stipend to Brahmans, for reading the Sástras to their chief; to Mohurrirs for keeping accounts; and to common personal attendants for menial duties, the particular conditions of each being specified in the pottahs held by the Jagirdars up to the present day. These grants were made out of the khalsah lands, or the demesnes reserved to the Raja, and out of jagirs falling back into his hands.

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[1] "The great Earl Warenne, in a subsequent reign, when he was questioned concerning his right to the lands which he possessed, drew his sword, which he produced as his title, adding, that William the Bastard did not conquer the kingdom himself; but that the Barons, and his ancestor among the rest, were joint adventurers in the enterprize." Hume, Appendix. ii. p. 101. With the exception of drawing the sword, I have received an exactly similar reply from a jagirdar of Palamow.

[2] The sunnuds or grants, now in possession of these tenants *in capite*, are all of a date much later than the time of Raja Bhugwunt Roy, and bear the signatures of his successors. These deeds generally fix the jumma payable to the chief zemindar at one-fourth (*chauthai*) of the gross produce; but it is not certainly ascertainable whether the first invader took any jumma for these fiefs or not. Perhaps, as inheritance became customary, and military attendance less necessary, the Raja

The subsequent history of the pergunnah resembles that of many a feudal principality in Europe. In the course of time, the jagirs became hereditary, and paid a proportion of the produce as a tax or rent; but they still remained unalienable, being resumed by the Raja in default of heirs, or on being abandoned. The evil influence of Dewans, who usurped authority, and appropriated revenues; the extravagance of degenerating zemindars, who, cash being scarce in these remote districts, bestowed lands in exchange for articles of luxury; the refractory spirit of the Jagirdars, who made war upon one another, withheld their annual payments, and took up arms against their sovereign upon the slightest provocation, so reduced the power and consequence of the Raj and zemindary, that at last, according to the rules of British policy, it was sold by auction for accumulated arrears of the Government revenue; a fate only different from that of many European prototypes, because of the singular picture here presented of an infant State coming in contact with a highly civilized Power.

Such was the condition of this province, when taken possession of by Government, as purchaser at auction, in the year 1814. It was divided into a number of military fiefs or jagirs, several rent-free tenures, mostly religious, and the khalsah or actual estates of the Raja. The larger lots of territory held by the relations of the Raja, the descendants of Dewans, or of principal officers, were, each in itself, so many imitations of the feudal establishment, of which they formed portions. Jagirdars supported followers who held fiefs under themselves; they bestowed lands for service, and were complete lords within their own limits, subject only to the conditions of their own tenure under the sovereign. The internal arrangements adopted by the British Government, on assuming the proprietary rights of the pergunnah, have no connexion with the present essay.

insisted upon their paying a jumma, or a kind of quit-rent, though the irrevocability of this tax in India renders it more probable, that it was demanded from the first.

This similarity with the history of Europe during the Middle Ages, may be more minutely traced in customs and privileges lately existing in this province. Besides the revenues derived from the khalsah lands, and the annual jumma of the jagirs, the Raja had many other sources of emolument, which custom appears to have made legal—a term, it must be understood, here used in reference to rights acknowledged amongst the natives. Whenever grief or misfortune fell upon the house of the Raja and Zemindar, whenever he betrothed a son or a daughter in marriage, and whenever he performed a journey[1], his jagirdars and the ryots of his private lands were called upon for assistance in money, or for appropriate contributions in kind. These resources seem as if they had been actually copied from the *aids* contributed to the sovereigns of Europe by their Barons, to ransom the royal person taken in war, to knight the heir-apparent, and to marry the king's daughter. Escheats of jagirs appear to have formed a considerable source of profit to the Raja of Palamow; in all cases of default of heirs, infraction of the conditions of tenure, minority, or incapacity for management from mental defects, or of sale without licence, the officers of the Raj lost no time in attaching the lands, and either added them to the khalsah, or bestowed them on other persons, perhaps from favour, perhaps in repayment of debt. Succession to landed property held under the superior, was a frequent occasion of extracting a liberal offering from the reluctant heir[2]; and when transfers of portions of fiefs were sanctioned by the sovereign, he had his share from the purchase-money. The household of the Raja, and of every considerable jagirdar, was a perfect feudal establishment. It was a matter of pride to be surrounded by a train of *vassals* under the titles of *burkundazes*, *fakirs*, *shikaris*, and *bhats*, or *bad feroshes*[3], and a still larger retinue of serfs called *kamias*, whose state of bondage is the counterpart to the condition of the *servi* of the eighth and ninth centuries in Europe. To these features of strong resemblance if we add the fact, that until the year 1814, the Raja had the administration of the police in his own hands, and consequently also the jagirdars, within their own jurisdictions, a more perfect model of a country governed by feudal institutions could scarcely be extracted from history.

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[1] The following passage in Hume seems actually to describe zemindary customs in the jungle tracts of Hindustan: "The tenants in the king's demesne lands were at that time obliged to supply gratis the court with provisions, and to furnish carriages on the same hard terms when the king made a progress, as he did frequently, into any of the counties. These exactions were so grievous, and levied in so licentious a manner, that the farmers when they heard of the approach of the court, often deserted their houses, as if an enemy had invaded the country, and sheltered their persons and families in the woods, from the insults of the king's retinue."

[2] This custom in the pergunnahs of Chota Nagpore, &c., surrounding Palamow, is carried to an enormous extent.

[3] The family poet or *bhat*, or *bad-ferosh*, is a conspicuous member of the train.

As the tenures of vassalage between the holders of village lots, and the chief zemindar, explained the character of territorial possessions to the officer who took charge of this pergunnah on the part of Government, so in examining the actual condition of the agricultural communities, he was surprised to find the ryots far more nearly resembling the *villains* of the Feudal system than enjoying any of those hereditary rights, with which some real or imaginary institution of antiquity seems to have vested the tenantry who plough the rich plains of Bengal and other provinces. The first invaders of Palamow divided amongst themselves the property in the soil with the proprietary title to the lands; the influx of Hindús that succeeded provided them with tenants and cultivators for such fields as they could not till by the labour of their own bondsmen[1]; and these latter either took parcels of land from them on lease, or paid an annual rent for separate fields. Such was found to be the state of the village economy in 1814; the landlord made an annual settlement with his ryots, allotting to them their fields for the next year, changing their lots, or refusing to renew their engagements as he chose. Rents were paid in cash, and at a rate equivalent to less than half the produce, because an equal partition of crops from inferior lands does not leave sufficient for the subsistence of the cultivator. The pergunnah had been long under the jurisdiction of the Company's regulations, which uphold the ryot in spite of the proprietary rights vested in the zemindars by the perpetual settlement; yet in Palamow the tenantry made no claim to independent privileges, not even to fixed rates of rent, and in one or two instances, when a decree of court surprised the people by a public restriction of the landlord's power to oust recusants, the declaration of the law has led to no attempts of the cultivators to free themselves from the character of tenants at will[2].

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[1] Fields so reserved by the landlord are called *khudkasht*, and this is the simple origin of the term.

[2] Not to appear neglectful in minutiæ, I will specify the general population and some of the peculiar customs of villages in Palamow. Of the inhabitants the following may be called village authorities, but are only complete in the larger *Bastis*[*]:

Jet Ryot; this is a person selected by the landlord as the most intelligent and honest of the cultivators; as no written accounts are kept in any part of the pergunnah, this person attends upon the zemindar's agent when he makes the annual settlement; he points out the different fields and their tenants; names the industrious and the careless; advises their remuneration or ejectment; and during the

[*] For similar customs in *Mysore*, see Buchanan, ch. 5.

The pergunnah of Palamow has been here selected for description, because its occupation by Government as proprietor, has led to a knowledge both of its early history and of its actual internal condition. But the surrounding pergunnahs of Sirgooja, Belonja, Koonda, Kainree, Chota Nagpore, Kodurma, and Ramghur[1], present, at this day, an appearance, if not exactly similar, at least essentially feudal in their internal governments. Their early records or traditions have not been so closely examined, but in each instance the zemindar is a Hindú of Rajput caste; and in Chota Nagpore and Sirgooja, by far the greater part of the population is composed of those singular races of men, who have been designated as the mountainous tribes of India. The assessment made on all these pergunnahs[2], at the time of the perpetual settle-

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current year, sees that all engagements are performed by the ryots. For these services his head is bound with a turban by the landlord on his appointment, and perhaps he receives 2 or 3 rupees as a present annually. The post is one of honor not of right, and depends entirely upon ability.

Brahman; this person propitiates the appropriate deities at the seasons of sowing; for this he gets a few begahs rent-free from the proprietor; and for ceremonies in families he has a right to take 10 seers from the rice crops of every cultivator when heaped in the granary.

Pahon; this person (not a Hindú) is the priest of the local gods, or the unquiet spirits of those whose death has been accidental; to each of whom he offers sacrifice twice or thrice in the year, at fixed times; he is also the recorder of the village boundaries, an office which is hereditary, the knowledge descending to him from his fathers; for these services perhaps he holds a few begahs of spring land, and obtains 10 seers of grain from each ryot annually.

The *Chokeedar* and *Goreyt* (the watchman and messenger) are generally the same individual, and receives five seers of rice in each character, from each asamee or ryot, and 2 or 3 begahs from the malik or proprietor.

The *Barber* and *Midwife*, being generally one person, has a right to 10 seers from the heap of each ryot for his personal services.

The *Carpenter* and *Ironmonger*, for repairing ploughs and tools of husbandry, receives at an average 1 maund or 20 seers from each cultivating tenant.

These persons compose the village establishment, which, as no written accounts of any kind are kept, does not include any officer similar to the patwari of other parts. Documents of sale and mortgage and farming leases are the only deeds drawn up in writing, besides the sunnud of the fief.

Residents, if not *ashraf* (or men of higher classes) pay a trifling house rent to the proprietor*. Ryots are exempted from this, and are entitled to a few biswahs, as garden round their houses. When they remove to another village they may take away their chappars or roofs, unless in debt.

Wood, grass, water, and fish, are free to all.

Pasture is abundant and also free.

Rents are paid in cash; but payments amongst the peasantry are made in kind.

[1] I might add all the zemindaries of the Jungle Mehals, but do not, as I have less acquaintance with their customs.

[2] Excepting that of Sirgooja, which did not come within those arrangements.

* The jagirdars receive these rents.

ment in 1789-90, was nothing more than a blind bargain with the sovereign zemindars, without the slightest inquiry into the actual revenue produce, or the modes in which it was collected. Since then, causes have come before the local civil courts which have sufficiently shown the similarity of the landed tenures with those of the feudal ages; and the numerous criminal cases which have brought the inhabitants under the eye of the magistrate, have betrayed not only their personal dependence upon their several chiefs, but have brought to light traits character of remarkably similar to what history tells us of the Scandinavian conquerors of Europe. The great difference between the institutions of these provinces and those of the rest of Bengal and Behar was the cause of extreme difficulty in introducing the same system of administration which had followed the British dominion elsewhere. A special provision of the Regulations declared the hilly parts of the district of Ramgurh exempt from the operation of the General Regulations, so that until this day the judge has a discretionary authority in deciding the civil disputes that come before him.

From the pergunnahs which have here been described as feudal, various kinds of that form of government may be selected. Ramghur and Chota Nagpore are two little absolute kingdoms, consisting of small *counties*[1] giving titles to their chiefs, who hold grades of rank at their sovereign's durbar. These are Rajas, Thakurs, Thakurays, Manjhis, and Manhas; and the Raja of the latter pergunnah lately fell under the displeasure of the magistrate for vesting one of his creatures with the title of Thakur, in return for a sum of money. While most of these zemindaries internally present a deplorable state of things from oppression or mismanagement of the revenues, Ramghur alone represents a feudal principality in as prosperous a condition as such could well enjoy. Freeing himself in early youth from the baneful influence of dewans who had inherited that post for some generations, the present Raja took into his own hands the superintendence of his estates, which are now spreading far and wide through the jungles that cover so large a portion of his province. The local courts, I believe, do not contain a single record of any dispute between this zemindar and his tenants: and this has been proved not to arise from forcible prevention on the part of the superior; for during an official march through this pergunnah in 1827, the magistrate scarcely received a single petition from a complainant ryot. Raja Sidnath Singh has made himself the judge of his own jurisdiction; in his kachheri contending cultivators and farmers obtain a more speedy and a more amicable adjustment of their disputes than in the Adálat; the whole country is tranquil, happy, and progressive in civilization; and the most philanthropic advocate of the ryots could not here find, that the authority of the feudal proprietor and landlord hangs heavy upon the head of the vassal tenant. This Raja is the only one of this large district, in whose hands Government could find it safe to leave the charge of the police[1]; and with half the establishment that is maintained under the magistrate in the neigbouring divisions, he succeeds in suppressing crimes to the proportion of two-thirds.

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[1] The local divisions here are called pergunnahs, chuklas, and tuppahs, also gadies.

Here is a brief, but as far as it goes, an accurate description of certain parts of Hindustan, which, compared with the rest of the Brifish territories, are in an infant state of general, and particularly of agricultural civilization. Specimens might be selected of a still more savage state of society from the hills of Bhagalpore, the Garrow mountains, and even from individual tribes of the very country from which our example has been taken; but the singular races of people here referred to have not yet emerged from the hunting or pastoral stage; they are not yet an agricultural community; and, what still more concerns the present review, they are not Hindús. I know no tract of the provinces under the presidency of Bengal which affords a prospect of Indian territorial customs, so interesting, for primitiveness, as the range of hills I have described. I do not look towards those numerous estates which are emerging from the jungles, under the genial influence of British dominion, because these are growing up under laws of a character new to the country, and consequently exhibit ancient habits and institutions working under the correction of modern principles; this part of the subject, however, will meet with consideration in another place.

We find then, that in certain pergunnahs, where the Mahommedan arms seldom penetrated, the Subahs being content with a small tribute[2], there exist several extensive estates, the internal goverment of which exhibits a Hindú system, extremely similar to that which in Europe has been called the feudal system. From the progress of things, which we have traced in Palamow, we may extract the following principles: 1. That the invader of the pergunnah considered or constituted himself, by the right of conquest, sovereign of the soil, and of his own authority gave away portions of the lands to his followers.

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[1] He holds the executive without the power of punishing.

[2] Palamow paid 5,000 rupees to the Moghuls—12,182 to the British Government.

2. That these followers did not receive proprietary right with their grants, because they had not the power of alienation[1]; that afterwards by making their jagirs hereditary they made an attempt to become proprietors, but still did not become more than landlords. 3. That the Raja received an annual jumma from the jagirdari land, and that this jumma more resembled rent than tax, because it was paid upon property not alienable without the consent of him who received it. 4. That those who actually cultivated the ground under the landlord or the landholder, were tenants from year to year, and claimed no hereditary rights.

It may be said that the forcible occupation of Palamow, which took place in the time of the Emperor Jehangír, was similar to the practice of the Mahommedan conquerors of Hindustan, who attempted to make distributions of land similar to that adopted by Raja Bhugwunt Roy. The name given to the feudatory chieftains (jagirdars) seems to support the resemblance: but this single denomination is the only one of the tenures in the pergunnah which is of Persian etymology; the under-titles of possession consist of a variety, such as Birt Baya-pattah, Kus-birt, Pigdhar, &c., which, though the derivation may be obscure, are perfectly Hindú. But whether the Raja and his followers were imitators of the Mahommedans or not, a feudal territory has been the result of this policy; and if the former fact must be allowed, it will interfere with the inferences I shall draw from it, less than with those of the author of "Observations on the Constitution of India," who is unprepared to allow that there is any thing at all feudal in the relation between zemindar and ryot in India[2].

It seems, then, that the Raja of Palamow, (and also the surrounding Rajas, whose situations were similar,) constituted himself proprietor of the soil and sovereign; and that he continued in the joint character as long as he remained independent, as long as no sovereign greater than himself conquered and displaced or made him tributary. The Subah of Behar, about a century ago, succeeded in fixing an annual tribute on the pergunnah of 5,000 rupees; his sovereignty then expired, and the Emperor of Dehli became his superior; but being confirmed in his lands, and the tenures by which others held of him being in no way changed by the payment of tribute, the Raja continued in his other character of the proprietor of the soil.

[1] It may here be mentioned, that the Rajas gave away several villages without any jumma being attached to them, chiefly to Brahmans; these rent-free tenures were found, in 1814, to comprise above one-fifth of the pergunnah.

[2] See the above work, p. 30.

The feudal government of the pergunnahs above described, may be examined and known as existing at the present day, in the centre of the British territories: but traces of feudal institutions are not only to be found in States of comparatively recent formation; the remains of a similar system exist in many parts of the country, where the descendants of those who were independent Hindú princes, before the Moghul conquest, still hold zemindaries. The principalities of Tirhoot, Tipperah, and Kooch Behar, the ruling families of which have outlived the violence of invasion, afford abundant internal proofs in support of this remark. Upon the changes that have occurred in the first of these zillas (as now called), being that best known to myself, I shall say a few words.

Tirhoot, a part of the ancient province of Mithila, was not invaded by Mahommedan arms until the year 1237 A. D., when Toghan Khan, the Subahdar of Bengal, made an inroad into the country and raised contributions from the Raja and his people. Under the Emperor Ala-ud-deen, in the year 1325, it became a province of the empire, and the territorial system of the Mahommedans was introduced[1].

The internal change occasioned by this conquest immediately or gradually, may be ascertained from the Taksim Jamma, contained in the Ayin Akbari, which enumerates the mahals, seventy-four in number, into which the Sircar became divided; amongst these the largest, "Tirhoot and its dependencies," is registered at a revenue of 1,307,706 dams. We know that previous to the conquest, the Raja was sovereign over the whole country, thus divided after its subjection into seventy-four different mahals; we know also that the Raja was not entirely ousted from his possession, but retained the largest mahal, called as above noticed, "Tirhoot and its dependencies;" and we know further, that when the province was delivered over to British authority, the kanungoe's daftar showed a similar registry with the names of malguzars for each of the mahals: the minor mahals only had been subdivided into more numerous zemindaries. From these three facts, I can only come to one conclusion with regard to the process of distribution and assessment adopted by the conquerors. The Raja remained the possessor of the lands which composed his khalsah during his own sovereignty, and which now became subject to pay revenue; and the tenures hitherto feudatory to him (with the annual jumma always annexed to territorial investitures, unless they are actual gifts,) became separate mahals, paying a land tax into the treasury of

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[1] Hamilton.

Dehli, instead of the kachheri of Durbhunga[1]: a change that may be illustrated by the description I have given of the tenures in Palamow, where, had an assessment been introduced instead of a mere tribute from the Raja, the jagirdars would have been made malguzars of their lands, as their former sovereign was of his own villages.

Under the new system then, the Raja of Tirhoot fell from the condition of a sovereign to that of a zemindar; and being confirmed in the possession of the lands already forming his khalsah estate, he continued to be, in every sense of the word, their proprietor. The heritage of this zemindari having fallen into the hands of Chhutur Singh, the present incumbent, without a single flaw in the succession, we know that the proprietary rights of the family have withstood every public change. The same revolution that reduced the Raja from his character of sovereign to that of a mere proprietor, raised up his jagirdars or under-tenants, by whatever name they may have gone, to the same rank. The treasury of Dehli being now the place for depositing their jumma, they became released from all the ties of vassalage, and at the same time, from all superior authority in their tenures. Their new sovereign, content with the fixed portion of the produce, left them the free disposition of their interests or estates.

The celebrated settlement of Torul Mul professed to be made upon a measurement of the soil, and a weighment of its crop, a third of which in kind was fixed as the revenue for most articles of produce, and cash-rents were adjusted at equivalent rates for indigo, opium, &c[2]. Collections were made on this principle for nineteen years, at the market prices of each kind of produce, the average of which collections, calculated at the average prices, formed the fixed settlement for ten years

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[1] The Raja's capital. As the Ayin Akbari was compiled 250 years after the conquest, it cannot be determined whether this change was gradual or immediate.

[2] Ayin Akbari, (translated) vol. ii. p. 287.

There is some confusion in the Ayin Akbari regarding these settlements: v. i. p. 292, it is written, "The husbandman has his choice to pay revenue either in ready money, or by kunkoot, or by bhowlee;" and in the instructions to the Amil (p. 304), occurs this passage. If in the "same place some want to engage by measurement, and others desire to pay from an estimate of the crops, such contrary proposals shall not be accepted;" and immediately afterwards, "Let him (the collector) not be covetous of receiving money only, but likewise take grain." And the modes of dividing the crop are then enumerated. Now if the revenue was collected by any mode in kind, whence came the registered fixed rate and the fixed settlement for ten years? Though the instructions may be applicable to the time of measurement and investigation, still they appear contradictory. The Taksim fixed jumma, however, must have been prepared as stated in the text. See Ayin Akbari, v. i. p. 294.

The revenue was settled with, and collected from the actual cultivators, if the instructions to the amils, as given in the Ayin Akbari, can be supposed of universal application; no mention is there made of zemindars, as persons interested in the cultivation and produce; at the same time, it must be stated, that amongst the collecting officers of Government which are enumerated, from the amil to the patwari, there occurs no such individual as the zemindar[1]. In the details of Akbar's settlement, all mediate holders between Government and the ryots are passed over in total silence. But we know that the ancestors of the Raja of Tirhoot were Rajas, and holders of the mahal registered "Tirhoot and its dependencies" in the time of that emperor; we also know, that when this province was transferred to our rule, the other seventy-three mahals of the district consisted of separate zemindaries, registered in the names of single or joint malguzars. From these simple facts, I feel myself warranted in concluding, that at the first Mahommedan settlement of the province, the fiefs under the original sovereign became separated mahals under the Moghul, and their holders zemindars of the tenures, as the Raja was of his khalsah lands; and as his title was omitted in the Taksim Jumma of Akbar, so were theirs.

If then the persons originally called maliks, and since loosely called zemindars, existed during and after the period of Akbar's registered settlement of Tirhoot, they must have held an interest in the soil, independent of the third share of produce appropriated by Government, as public revenue[2]. This supposition is in perfect conformity with the general principles of Mahommedan administration, which proclaimed, by right of conquest, a confirmation of their land tenures to the natives; and after settling the rate of land-tax, left the various tenants to settle their interests and shares amongst themselves. Had these zemindars been appointed by Government as its collectors of rent, and had they been paid by a per-centage on the collections, the circumstance would certainly have found a place either in the list of official agents, or in the estimates of the revenue, with the charges upon each local treasury, so particularly specified in the Ayin Akbari[1]. Though this celebrated work affords ample proof, that the ryots or husbandmen were the class of persons with whom Government dealt in settling the public revenue, it does not contain a single expression favourable to the hypothesis, that the zemindars were officers of collection.

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[1] The name occurs in the Ayin Akbari, though not in the sections relating to the settlements; whenever it does occur, it is in the sense of a landholder. See v. i. pages 299, 187, and v. ii. page 16.

[2] In the Ayin Akbari, to the rent-roll of the land-taxes, the military force that every Sirkar is capable of furnishing is subjoined; as in Tirhoot 700 cavalry and 80,000 infantry. These forces are called (v. i. p. 187), the zemindari troops, a sufficient proof of the existence of the zemindars, and indeed of their character.

There is another circumstance which militates against this modern theory. The seventy-four mahals of Tirhoot, when yielded to the Company, appeared, as I have already stated, to be subdivided into a great number of zemindaries, great and small, from the Chukla of Raja Chhutur Singh's ancestor to the single village shared among joint holders, whose portions were in many cases no greater than $\frac{1}{100}$ each[2]. In the idea that zemindars are officers, we can imagine this appointment over large estates; but when we find in a pergunnah of 500 villages a list of 200 zemindars, can we believe it possible, that Government would place so many collecting officers over so small a space of country? The very existence of so many estates is sufficient to prove, that they have grown up independent of the Government, by the usual modes of acquiring property, if indeed they were not in being before the rise of the Government itself. Two-thirds, we find, were left of the produce after deducting the land-tax, besides the profits of waste lands, when the assessment was fixed for a term of five years. So large a residue, in the hands of the ryot, must inevitably lead to accumulation, and the certain result of accumulation amongst the agricultural classes is the extension of possessions in land. Thus, had no zemindars existed previous to Akbar's settlement, the means of purchase alone afforded by it would have been sufficient to introduce the distinction of landlord and tenant. In such a process, the portion of produce accruing as rent to the zemindar would now, in the course that things took place gradually, approximate to the ten per cent.[1] on collections (or $\frac{1}{20}$ of the crop) lately discovered to be his official due, and granted on this principle in modern assessments. Of the two remaining thirds of the produce, less than a portion equal to one-half of the whole, is necessary to subsist the ryot after paying expenses of cultivation. This share, when estimated for cash rents, will leave something less than one-sixth to the zemindar; for in all such calculations, fractions are rejected in favour of the ryot. This sixth soon became reduced under the successors of Akbar, when by introducing the system of farming, the assessments became a mere matter of bargain between the landowners and the Government officers.

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[1] The author of "Observations on the Law and Constitution of India" has extracted from the Ayin Akbari many an argument in favour of the *property* of the cultivators, but he could not find one in favour of the *official character* of the zemindars. He appears to have misapprehended the evidence afforded by that work on this question. To make a just and fair assessment, Torul Mul measured the actual lands, ascertained the produce, and of course in all inquiries came only in contact with the cultivators. Into the question of proprietary right he never enters, leaving this to be decided by the courts or customs of the country.

[2] The subdivision of lands by inheritance, exists to a surprising extent in Tirhoot, and in consequence the file of suits in the Civil Court is more than a single judge can keep clear. The criminal calendars, at the same time, afforded abundant proofs of the jealousy occasioned by the relative terms of malik and ryot. Joint estates, from mismanagement, frequently come to the hammer; and the disinclination of the old maliks to become ryots to the new purchaser, leads to almost daily breaches of the peace. The interpretation of ryot as a tenant, is here of much older *date than* the Regulations of Lord Cornwallis.

I have been led to enlarge perhaps too much in this place upon this interesting question. It was merely my intention to collect a sufficient number of facts and considerations, in support of my opinion, that the Hindú principality of Tirhoot, previous to its dismemberment by the Mahommedans, was a government similar in principle to that which I have described as existing in the mountainous tracts of Behar, though advanced to a much higher stage of civilization. This to my own belief I have accomplished. But if I have found grounds for supposing that the administration of the ancient Rajas of Tirhoot was conducted on the principle of a feudal relationship between the sovereign, his jagirdars, and the people, I cannot help extending the opinion so acquired to the other Hindú independent kingdoms of Bengal and Behar.

Gaur, Dacca, and Nuddea have been successively mentioned as the seats of large dynasties in Bengal, concerning which we can obtain no particulars whatever. But after the Mahommedan conquest, the historians of Dehli name several petty Rajas, confirmed as zemindars by the Empire. Of these Bishunpore[2], Bokla, Chittagong. Cuttack, Kooch[3] (Kooch Behar), and Tipperah are the principal. It may be remarked, that to consider the Rajas of Kooch Behar and Tipperah, (the only remaining zemindaries of this list,) in the light of official agents, would be a subversion of rights, much older than the dominion of the Moghuls. Both are independent princes, exercising sovereign authority in their respective zemindaries.

In the above observations, I would not be understood as arguing, that all who pretend to, or have appropriated to themselves, the title of zemindars, are necessarily of the class of Hindú feudal proprietors, for whom I claim more than an official interest in the soil. Many zemindars of the present day can trace their origin no farther than to an amil's grant: the very name of Taluk would seem to imply, that this tenure was very generally of such a character. But let not the circumstance, that zemindaries were occasionally so created or usurped, be reasoned upon as fixing the character of all the interests or properties which bear the name. I hope I have made it clear that many of the existing zemindaries of both Bengal and Behar were feudal properties of more ancient date, and more analogous to the manorial and baronial properties of Europe.

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[1] See Reg. II. 1822.

[2] Ferishta.

[3] For these four, see Ayin Akbari, v. ii.

Behar, under the title of Magadha, formerly included the province of Bengal[1], and in later times, was the seat of a Jain dynasty at Rajgriha, and of a Budh community (perhaps also kingdom) at Gyah. How, or when, these Powers were subverted by the worshippers of Brahma, it is impossible now to ascertain; but we find the Mahommedan arms resisted, in their earlier invasions, by Rajas of Behar, Monghir, and Rhotas, besides Tirhoot. Of these none remain but the last, unless indeed the Khurukpore family, made Musalmans by force, be regarded as still representing the Rajas of Monghir. From the dismemberment of Rhotas, after the fort was taken by Sheer Khan, in A.D. 1542, the expedition, which, as I have related, subdued and populated Palamow, proceeded: and from the arrangements made by the Chiru leaders in the new lands, we may reasonably take pattern of the institutions which existed in the old pergunnah, from whence they came.

The simple and important inferences which must be drawn from the review here taken of Tirhoot, and of the provinces of Ramgurh, are, that, at least in these parts of Behar, there is just as little reason for declaring, that at any time before the cession to the British, the person called zemindar was a mere officer from Dehli, as that the cultivator was the proprietor of the land he tilled.

[1] Hamilton.

Art. XXV.—*Extracts from a Report on Chota Nagpore.* By S. T. Cuthbert, Esq., *Magistrate, Ramghur.*

[*Read February* 6, 1841.]

The pergunnah of Chota Nagpore is about ninety-five miles long and eighty broad, and is bounded on the north by the pergunnah of Ramghur, to the south by Gangpore and Singbhoom, to the east by the zillah of Jungle Mehauls, and to the west by Sirgooja. A large portion of the pergunnah is uncultivated, and its aspect hilly and jungle; but there are parts highly productive and well peopled, such as Loadugga, Pitonia, Burkaghur, Govindpore, Tamar, &c., &c., the soil of which places is extremely rich and fertile; and owing to the rain which frequently falls in these parts, and the general humidity of the atmosphere, the ground produces the most abundant crops without the fostering aid of irrigation, and often in seasons when they fail altogether in the neighbouring pergunnahs. The climate, from the setting in of the rains until about the middle of December, is extremely unhealthy; indeed, to the inhabitants of other parts of the country who may be compelled by business to journey into and sojourn in the pergunnah at that season, it may be accounted deadly.

The former history of this district is involved in obscurity; official records throw no light on it, nor is there an inhabitant who can give an account of it antecedent to its subjection by the ancestors of the present family; it is vaguely stated, however, to have been parcelled out into petty chiefships, governed by the rajas of the *Cole Rucksul* and *Ronsaughur* tribes. It is now divided into forty-four pergunnahs of greater or lesser magnitude, and is computed to contain about 5130 villages.

The account of the origin of the present family is involved in fable: tradition states their descent from the Nágavansís, or serpent race, mentioned in the Mahábhárata; and they are stated as having come from Benares. Their ensign is a flag with three snakes; and a serpent temple still exists in Nagpore, which the raja visits at the period of the Dasahrá; the worship of Durgah and Lakshmí is, however, the prevailing religion. The first of the rajas, of whom a chronological list is preserved, was *Fun Mutukraj*, accounted to have been the son of the serpent Pandrak. This person is stated to have brought the whole of the pergunnahs under his subjection somewhere about the samvat year 1713, and to have obtained from the emperor of Delhi the title of Mahárájá Chhattradhári. From that period to the accession of the present rajah is reckoned 167 years.

Mahárájá Jagannáth Sahi Deva, the present rájá, succeeded to the raj about four years ago, and is about twenty-six years of age: he appears of a mild disposition, and seems disposed to listen to good advice. Like the generality of persons, however, in his situation, he evinces neither talents nor inclination for business, and leaves the management of his affairs to his dewan and other officers. Of late he has made a change in his ministerial servants, having displaced Dewan Bisoaram, a man who had long been the confidential servant of his family, and appointed to the situation a Brahman named Joaram Guru, to whose care he has entrusted the interests of his zemindari.

The revenue which the raja derives from the jagirdars, according to a statement delivered into the hands of the magistrate in 1827, amounted to 3,38,077 rupees; independent of which he possesses the pergunnah of Tooree, and a number of valuable Bandhar villages; and I consider I speak within bounds in stating his income from these sources at 80,000 rupees per annum, independent of abwabs.

Besides these sources of revenue, he receives money as nuzzerana, under the denomination of *Bundeapun*, whenever he bestows a jagir, or confirms the sunnud to heirs of deceased jagirdars. This sum not frequently amounts to 1000 or 1500 rupees, and is regulated according to the number, extent, and value of the villages specified in the grant. The new dewan is inclined to set up a claim on the part of his master, to recover the greatest part of the jagirs, under the plea that the word "Bundeapun" implies mortgage, and that the monies have been more than repaid out of the usufruct of the lands. When, however, it is considered that no such claim for recovery has been brought forward by any of the present raja's predecessors, and that the word Bundeapun is found inserted even in those sunnuds containing these words, it is impossible to acknowledge the correctness of such a construction.

Another source of revenue is the sale of titles: the raja, assuming the power of a sovereign prince, has not hesitated to confer the titles of raja, koaer, thakur, manki, &c., &c., for a pecuniary consideration. About six months ago the title of rajah was bestowed on Thakur Hari Sing of pergunnah Burrandah, and the raja received a nuzzerana of 1000 rupees on the occasion.

On the raja's accession to the raj, a collection of one rupee is made from every village throughout the pergunnah; this is called

Sihak Kharch. On his marriage likewise, a similar collection is levied, termed Haldiyapun. Whenever the raja has to perform a pilgrimage or a journey to visit the magistrate, or is pressed by the collector for revenue, in short, whenever his necessities are pressing, every village in the pergunnah is called upon to send in its quota to enable the raja to meet such exigencies. Thus under the terms mandid and mangan, it is impossible to say what the raja's officers collect from the villagers, upon whom the burden of furnishing the supplies principally falls. Under such a system of feudalism, giving rise and colour to every species of extortion and plunder, it is not to be wondered at that the population of the province is so limited when compared with the extent of the area.

Six subordinate pergunnahs are incorporated with Chota Nagpore, viz., Tamar, Buruda, Raie, Bundoo, Salee, and Bhurwa. How or when these pergunnahs became dependent on the raja of Chota Nagpore I cannot ascertain, but it would appear that for a long time the dependence was little more than nominal. It was not until the country came into the British possession that their rajas were permanently and actually incorporated with Chota Nagpore. The revenue which these rajas pay at present to the raja of Nagpore, was fixed by Major Crawford in 1840 Samvat, and is as follows:—The raja of Tamar possesses about 185 villages, and pays as Málguzárí 2660 rupees; raja of Raie 83 villages, pays 1500 rupees; raja of Bundoo 88 villages, pays 705 rupees; raja of Salee 87 villages, pays revenue 847 rupees; raja of Buruda 255 villages, pays 1462 rupees; thakur of Bhurwa 29 villages, pays 846 rupees. The raja of Chota Nagpore has no rights in these pergunnahs, saving the revenue payable to him, and thus these rajas may be considered in the light of Talukdars. The rajas, however, still acknowledge the raja of Chota Nagpore as their feudal chief; and on the death of a raja, his successor waits on the raja of Nagpore, pays homage, and presents a considerable nuzzerana, generally 1000 rupees, and receives the title from him.

The same feudal rights and customs prevalent in Chota Nagpore proper are exercised by these rajas. Of the personal character of these chiefs much cannot be said in praise,—they are wholly illiterate, and for the greater part utterly ignorant of the most common affairs of life. On asking any question concerning their country, reference was invariably made to the dewan for information, to whose management they entrust everything.

In times prior to the period when these provinces became subject to the British government, the rajas and independent chiefs of bordering districts were continually engaged in predatory and petty warfare; these invasions and intestine dissensions were so frequent, and the ravages committed so great, that it became necessary for the heads of the contending parties to contrive some method of keeping in a constant state of readiness and attendance a sufficient number of followers, for the purpose not only of defending themselves against sudden enterprises, but with the view also of possessing the power of making reprisals on their neighbours.

The plan adopted by the rajas that they might always have a number of partisans ready at a moment's notice, gave rise to the now long established custom of bestowing lands in jagir,—a feudal tenure, the very counterpart to those engagements which existed to so great an extent in Europe during the middle ages. Although, from the nature of these feudal tenures, jagirs were originally granted solely in consideration of military services, yet services of a civil and religious nature were afterwards similarly rewarded at the pleasure of the superior. The number of larger jagirs was twenty-six, consisting of about 2531½ villages; these jagirs have invariably descended from father to son; and both the custom of the pergunnah and the practice of the courts, hold them as hereditary in the direct male line. On a jagirdar dying without male issue, the jagir generally reverts to the raja, as females in this country do not succeed to real property.

The jagirdars (with few exceptions), particularly those who possess power, have always been considered a turbulent description of people; and their dependants, although oppressed by them, do whatever they desire, from the mere habit of obedience which they have always been taught to consider due to their immediate superiors, and are frequently excited by them to plunder their neighbours.

The half-deserted villages which are frequently met with, evince the oppressive conduct of these people as landholders. On enquiring the cause of such almost universal desertion, one described it to be the Hundeen, or Pachagi Tax; which, however, had been abolished some time previous, and which in very many places the jagirdars prevented the ticcadar from collecting; another attributed it to the people being harassed by perpetual calls to furnish supplies to the military; but the desertion must chiefly be imputed to the conduct of the principal landholders towards their ryots, and their not granting receipts for the payment of rents, which alone opens a wide door to abuse: add to this the effects of the feudal system, which, under the most favourable circumstances, must ever act as a check to the increase of population, by damping the industry and independence of the people.

The mankis and momdas, after the jagirdars, are next in importance as a body of proprietors in this pergunnah. These people are of the Cole and Bhungea caste, and are principally confined to the pergunnahs of Tamar, Raie, and Buruda. The mankis and momdas hold their lands from the raja of the aforesaid pergunnahs, from whom they receive begrees, the form of their appointment, and to whom they pay a quit-rent. The mankis are generally holders of twelve villages, and the momdas of three or four; and the tenure is considered hereditary. The country in which these mankis and momdas reside is full of fastnesses, places difficult of approach and strongly fortified by nature. The pergunnah of Tamar at present is in a state of profound tranquillity, which is not likely to be disturbed.

The heads of villages in this pergunnah are called Mahtons; these men, in conjunction with the village pujaris called Paons, transact the whole of the business of the village; they make the annual settlements with the ryots and collect the rents; and the Mahton is answerable to the proprietors for the revenue due from the village.

In the month of May, the mahton and paon assemble the cultivators who may be willing to cultivate, and distribute amongst them their different portions of land. The ryot receives no pattá or written document; but the extent of his jote or field is pointed out to him generally before witnesses, on which he receives a piece of earth from the mahton; and this ceremony is the token of having agreed to lease the field, and is called receiving *goti*, the form of the ryotwar settlements in this pergunnah.

The rents throughout the pergunnah are universally paid in money, generally on three, but sometimes in four kists; viz., 1st kist, Pancha, in the month of Assin; 2nd, Magni, in the month of Magh; 3rd, Hakimi in Chait; 4th, Punti in Assar.

The offices of mahtoon and paon are considered hereditary. The mahtoon is allowed by the proprietors one pame or two pame of land for his own cultivation, according to the extent of the village; besides which he receives at the period of cutting the crops, one pakka falús from each assami. The paon, who is the pujari of the village, likewise gets a similar portion of land for his religious services in deprecating the wrath of the evil spirits with which all the villages are supposed to abound. The pujari's fees form the chief item in the village expenses, and sometimes amounts yearly to the sum of thirty rupees, for fowls, sheep, swine, &c., &c., for sacrifice; the expense generally falls on the ryots. The puja takes place three times a year, viz., Assar, Paus, and Chait, but oftener in case of calamity occurring.

Lands considered as hereditary property of the cultivators are as follows:—

1st. Land which formerly was jungle, but which has been brought into cultivation by the labour of the ryot, is termed *boonheree-ket*, and no revenue is demandable for it.

2nd. Marshy and swampy lands brought into cultivation is called *byebut-ket*, and becomes the property of the cultivator, without being subject to the payment of revenue.

3rd. Land granted as *batkeeta* generally from one pame to one karee in quantity, the holders of which are liable to serve the proprietor as begaries, or must find substitutes whenever the latter moves, or requires such assistance.

The land in this pergunnah is not reckoned by beegahs but by annas, pames, karies, barrees, and bands. A pame is a portion of land sufficient for sowing two or three maunds; four pames make one karee; eight karees one barree. A pame generally lets for three rupees, according to the quantity of the land. In Tamar they reckon by bands, or a portion of ground capable of receiving ten maunds of seed. When a ryot takes into his cultivation kist-shallee, or soil of the first quality, together with chíra bárí, or ground near his dwelling, for garden, &c., &c., and zamin tar, or land of an inferior kind, such a jote is called leka-ket, for which he pays at the rate of four rupees per pame.

The ryots generally use a plough, to which two oxen are yoked. In good seasons, after defraying every expense of cultivation, rent, &c., the profit accruing to the ryot on one plough is calculated from twenty to thirty maunds. It is not the custom of the proprietor to make advances to the cultivator; should the latter require pecuniary assistance, he must have recourse to his mahajun, who advances him the necessary sum, receiving as interest one anna per rupee. If seed is advanced the ryot must repay his mahajun at the end of the year double what he borrowed, viz., for one maund borrowed he must return two. The custom of cultivating villages by pai-khast ryots is not frequent in this pergunnah.

In Chota Nagpore, equally with the rest of India, it is established by custom, that the resident ryots have a permanent hereditary right in the soil, which they cannot be deprived of, so long as they continue to pay the rent justly demanded of them with punctuality. Receipts, though granted to jagirdars and likhadars, and even to the heads of the villages, are withheld from the ryots; it would be well that the raja and principal landholders should introduce the practice of giving these people written receipts, thereby rendering respective rights more secure.

The principal crops in this pergunnah are the kharif and badari; the produce from the rabi is comparatively trifling. No measurement of the land takes place at the annual settlement; the Mahtoon, in parcelling out the lands to the ryots, divides the mewa trees amongst them; the produce from other trees goes to the proprietor. The price of field labour is one piala, or wooden cupfull of rice, or different kinds of pulse, and half an anna per diem; some, however, receive one bundle in twenty-one bundles of the crops cut. The proprietor does not receive karcharai, or money for permitting cattle to graze.

There are three different species of bondsmen in this pergunnah: 1st. When a person receives a sum of money from another, and executes a deed called sanunk patra, he becomes that person's bondsman, or sanunk for life, and cannot be released from his bond, though he offer payment of the money he received; the deed of sanunk patra, however, does not affect the children. It is expected that the master furnishes his bondsmen with food and clothing; generally he pays the expenses attendant on marriage. 2nd. A person who borrows a sum of money from another, stipulating by a deed to serve the lender for a specified time, or until the amount of the principal and interest be repaid. This bondsman has an allowance of a maund of rice a month, and one rupee is given to him at the cold season, besides which he is entitled to one bundle out of twenty-one bundles of the crops at the cutting season. 3rd. A person who hires himself for field labour, the period of which service is generally from Magh to the end of Paus, and should the bondsman run away within the period of service, the master is entitled to damages on account of loss of services. This kind of bondsman generally received six rupees a year and twelve maunds of rice.

The Coles emigrate in great numbers annually in search of employment, and are entertained by indigo planters and others. They are generally preferred to the labourers of other parts of the country, on account of their performing more work and at a lower rate. In a family consisting of four or five persons, two are left at home to take care of the family affairs, and cultivation, &c., the rest go abroad to seek service. Panchayets are not frequent, except in cases of witchcraft; when the people do not apply to the court, they resort to the head men to settle their disputes.

The peasantry, generally speaking, do not appear to enjoy a state of great comfort; their huts are miserable, and their ordinary food is of the poorest kind. There are three descriptions of Coles, *Rumeen, Aorwun*, and *Moonda;* these vary in language more than in manners. Their language, especially of those on the frontier bordering on Singbhoom, is not generally understood, and when the Coles are brought into the Sudder station for criminal offences, they are invariably accompanied by an interpreter.

These people are of the lowest kind of Hindús, and in their manners and customs are little removed from savages. The only covering worn by the women is a small piece of cloth passed between their thighs. Their intimacy and connection (for they intermarry) with the Lurka Coles, was formerly considered so demoralizing and so detrimental in its effects to the welfare of that part of the country, that it was thought necessary to restrict such intercourse by every possible means. This may have been the case before Singbhoom came into our possession, but since that period the character of the Coles would seem to have improved, or they are better governed, as they now refrain from committing those lawless depredations on the borders, to which they were formerly so prone.

Markets are held once a-week in the principal villages throughout the pergunnah, which are stated to be sixty-seven in number. The various duties, under the denomination of *rusum ganjit*, were formerly let in farm by the proprietors, and were a source of considerable emolument; notwithstanding such collections are strictly prohibited, there is reason to believe that they are still secretly levied under the name of *mohtarfa*.

Rice, cotton, sugar-cane, shurshuf, kunjíd, surguga, and several kinds of pulse, are cultivated in Chota Nagpore; the hills produce great quantities of gum lac, silk, rukh, silájit, bunstokhun, and tikhur. The cultivation of the poppy has not as yet been attempted on the part of the opium agent, though there are many parts of the pergunnah in which it might perhaps be successfully introduced. Iron ore is found in considerable quantities in these hills, and gold is picked up in the beds of some of the rivers. A diamond mine is stated likewise to exist, but the raja and the landholders are cautious, and withhold all information concerning its productive powers, or the mode of working it.

There are no navigable rivers in the pergunnah. The exports consist of rice, cotton, lac, iron, &c., &c.; in return are received salt, brass and copper utensils from Bancoorah, and cloths from Sumbhulpore.

The salt agent at Patna has a gomashta in the pergunnah, to prevent the importation of contraband salt from the province of

Cuttack; but notwithstanding those precautions large quantities of salt are annually smuggled through the province, with the connivance of the gomashta.

Under the Mahomedan rule, the rajas of Chota Nagpore paid a peshkush of about 15,000 rupees annually. Notwithstanding the capabilities of this fine and extensive pergunnah, no increase in the jumma took place at the decennial settlement. At present the government demand stands as follows:

	Rs.
Land Revenue	14,100
Abkaree	12,000
Sum Total	26,100
Deduct Expenses	5,004
Balance	21,096

The perpetual settlement having been made with the raja for the whole pergunnah, no increase can now be expected in the land revenue.

On a consideration of the great extent and numerous population of Chota Nagpore, as well as the distance of the greater part of the pergunnah from the Sudder station, a native magistrate was appointed in the pergunnah. Since the establishment of the Moonsiff's Court (which took place in September, 1825,) to the 1st of January, 1827, the cases entered in the files are as follows:

Suits entertained	339
Suits decided	199
Suits appealed	2
Suits revised	1

Appended is a statement of crimes which have been reported, criminals apprehended, punished, and released, from the 1st of January, 1826, to the 31st of March, 1827.

It will be seen from the list that the total amount of cases for the year 1826 is 214, in which 488 men are supposed to have been concerned, 247 of whom have been apprehended, 156 punished, and 14 stand committed with every probability of their conviction. Of the 5 cases of murder, and of the 18 men supposed to have been concerned, 15 have been apprehended, 8 sentenced, 1 released, and 6 stand committed, and will most probably be convicted.

It is the characteristic of a barbarous people to be prodigal of blood, and to evince a want of tenderness and regard for life, when excited by the stimulus of strong passion; and murder stands prominent amongst the crimes prevalent in the pergunnah. The motives to commit the crime originate generally in jealousy, not unfrequently in superstition, and sometimes it is perpetrated from a spirit of revenge. An aggravated case of this latter description was tried at the first sessions of 1826. A substantial zemindar hired assassins to murder his neighbour, on account of a grudge he owed the latter, for having lodged a complaint against him to the magistrate. The assassins bargained to undertake the business for a very trifling sum in money and a few maunds of rice; the deed was committed, but the perpetrators paid the forfeit of their lives.

List of heinous crimes which have been reported to the Magistrate from 1st January, 1826, *to* 31*st December,* 1826, *by the police darogah of Chota Nagpore:*

	Cases.	Persons concerned.	Apprehended.	Punished.	Committed.	Released.
Dacoity	..	..	..	..	..	..
Rahzaní	2	14	..	..	..	..
Wilful Murder	5	18	15	8	6	1
Manslaughter	3	6	6	..	1	5
Burglary	102	142	89	50	6	30
Theft	61	125	75	48	..	27
Cattle-stealing . . .	39	76	55	46	..	9
Arson	1	2	2	1	..	1
Base Coin	1	5	5	..	1	4
Total . .	214	488	247	156	14	77
Ditto, ditto, *from* 1*st January to* 31*st March*, 1827.						
Dacoity	..	..	..	..	..	..
Rahzaní	..	..	..	..	..	..
Manslaughter	1	1	1	..	..	..
Burglary	52	123	37	24	6	7
Theft	22	35	19	6	..	13
Cattle-stealing	17	26	16	9	..	7
Total	92	185	73	39	6	27

MEMORANDUM ON THE PERIM FOSSIL, p. 340.

Professor Owen having undertaken to examine the cranium of the New Perim Fossil, has in the kindest manner handed me his notes containing the result of his scrutiny; any remark as to the value of these notes would be superfluous. Geologists can now satisfy themselves as to the exact character of this extraordinary fossil: all inaccuracies and deficiencies in my description are supplied in a manner which cannot be other than satisfactory to the Society.

A. Bettington.

"The number of molar teeth, $\frac{6-6}{6-6}$ *i. e.*, six on each side of the upper jaw, of which the first three are unilobate and premolars, the last three bilobate and true molars, and the double crescent of enamel on each lobe, prove it to belong to the order *Ruminantia*, whilst the great breadth or transverse diameter of the premolars, the wrinkled surface of the enamel, the number, size, and situation of the persistent bony cores of the horns, prove it to belong to the same extraordinary extinct genus of Cavicorn Ruminants as the *Sivatherium*.

"The general form and massive proportions of the skull, the great breadth of the interorbital space, the shortness of the nasal bones, the convex outline of the broad and short palate, and of the molar series, in the direction of the skull's axis, are all further marks of the close affinity of the great fossil four-horned Ruminant of Perim with that of the Sub-Himalayan tertiary deposits. Like the Sivatherium the anterior horns rise behind the orbits, and the posterior ones are continued from the angles of the supra-occipital ridge: in the small existing four-horned antelope the anterior horns are in advance of the orbits, and the posterior horns are much nearer the orbits than the occiput. But the Perim fossil differs from the Himalayan Sivatherium in the superior size, both absolutely and relatively, of the anterior horns, and in their mode of origin which is by a common base,—a structure unique in the mammalian class. The circumference of this common base measures two feet six inches at its origin, where it is subquadrate, with the angles rounded off, six inches across the forepart, nine inches across the back part, seven inches along the side of the base. This extraordinary process, which occupies almost the whole of the upper surface of the cranium, expands laterally as it rises, with a slight inclination backwards; and, although it is broken away full four inches above the base, yet the division has not taken place: it is, however, clearly indicated by a wide and moderately deep depression at the middle of the fore-part, which begins there at the base of the common process and widens as it ascends: the form of each division or anterior horn is indicated to be elliptical, with the long axis parallel with that of the cranium and about one foot five inches in circumference, and the horn would appear to have been directed obliquely outwards and backwards, but the fractured state of the fossil prevents any accurate idea being formed of its original length, direction, or figure.

" The fractured surface displays the coarse cellular structure of the common base of the anterior horns, which structure is continued as far as the right division or horn is preserved. The right posterior horn has been broken away close to its origin; the whole of the left posterior horn, with a considerable part of that side of the cranium, has also been broken away.

"The base of the right posterior horn is elliptical, one foot one inch in circumference, and the fractured surface shows the same coarse cellular structure which characterises the horn-cores in the bovine ruminants.

" The occipital region presents the form of a reversed cone, the strong superior ridge expanding, and being continued into the posterior horns. The middle of the occipital region is impressed with a deep cirriform fossa for the implantation of the ligamentum nuchæ.

" The temporal depressions have the form of horizontal fissures from the very slight vertical space between the superior ridge and the strong zygoma.

"The alveolar process of the superior maxillary bone is remarkable for its depth, which is a bovine character. The outer surface of the bone swells out into a longitudinal obtuse eminence above the alveoli, as it does also in the Sewalik Sivathere. The orbit is complete, and of great strength posteriorly. As in the Sivatherium and Giraffe it is situated lower down than in most other Ruminants. The upper contour of the skull leading from the base of the anterior horns, slopes down in an almost straight line for the extent of seven inches, where the nasal bones are broken away: in the Sivathere the corresponding contour is concave; and the transverse contraction in *front of* the molars is greater than in the Perim fossil. The occiput and occipital condyles are much less elevated above the horizon of the molar series than they are in the Sivathere of the Himalayas.

"But the most essential differences between this Sivathere and that of Perim are those, perhaps, which exist in the molar teeth. In the Himalayan Sivathere the inner crescentic ridge of enamel is sinuously plicated, and each lobe of the true molars presents a rugged ridge along its inner base: neither of these characters is present in the Perim fossil; but in this we find a minute tubercle at the bottom of the inner interspace between the two lobes, and attached to the hinder one. The inner prominent sides of each lobe are more angular and less rounded than in most Ruminants; the outer side of the posterior lobe is concave, with a slight medial rising: this is much more prominent in the anterior lobe, and the anterior external angle is thicker and more produced, a narrow and deep cleft dividing it from the middle prominence. This character is seen also in the premolars, which thus seem to repeat the character of the anterior rather than of the posterior lobe of the true molars.

"I have already mentioned the great transverse breadth of the premolars: they are also remarkable for the considerable bulging out of the base of the enamelled crown, at the free part of their contour."

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A Russia-leather Water-Bag, used by the Affghans -	
A Pair of Winter-Hose of Sheep-skin, worn by the Affghans - - - - -	
A small piece of Petrified Wood, from the Desert between Cairo and Suez - - - - -	
Two Silver Coins of Tiberius Cæsar, found in Coimbatore (with some hundreds of others), in an earthen pot, in the earth - - - -	*Capt. T. J. Newbold.*
A Hindu *Tamba patra*, on which is inscribed a Grant in the Sanskrit language - - - -	*General Caulfeild.*

ROYAL ASIATIC SOCIETY.

PROCEEDINGS
OF
THE TWENTY-FIRST ANNIVERSARY MEETING
OF THE SOCIETY,

HELD ON THE 11TH OF MAY, 1844,

THE RIGHT HON. THE EARL OF AUCKLAND,
PRESIDENT,
IN THE CHAIR.

THE HONORARY SECRETARY read the Annual Report of the Council, as follows:—

The Council of the Royal Asiatic Society have the satisfaction of congratulating the Meeting on the increasing prosperity of the Society, both in respect of the accession of Members, and the improvement of its finances. The number of elections in the past year has exceeded that of any previous year since 1839; and consists of fourteen contributing[*], and two Honorary Members[†].

Although the loss by death and retirement exceeds numerically the gain by accession, (but only to the extent of five); yet the increase in the number of contributing members is a subject of congratulation, and from this improvement the Council derive a confident hope that the advantages which the Society possesses for the collection and diffusion of knowledge relative to Asia are more widely appreciated, and will be more extensively drawn forth.

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[*] *Contributing Members:*—J. R. Colvin, Esq., Lieut. C. J. Cruttenden, Right Hon. Lord Elphinstone, Professor Forbes Falconer, Capt. Septimus Hart, J. A. St. John, Esq., Capt. Granville Loch, Major J. A. Moore, Joseph Mussabini, Esq., Lieut. Col. J. Outram, C.B., Henry Thoby Prinsep, Esq., Right Honorable Sir Edward Ryan, Edmund Smith, Esq., General E. Wyatt.

[†] *Honorary Members:*—Monsieur E. Biot, Hon. F. W. A. Bruce.

The following Members have died since the last Anniversary Meeting:—

Resident and Non-Resident Members.

George Arbuthnot, Esq.
Thomas H. Baber, Esq.
J. C. C. Sutherland, Esq.
William Stanley Clarke, Esq.
John Morice, Esq.
Maj.-Gen. Sir Joseph O'Halloran.
The Hon. George Turnour.
The Right Hon. Lord Wallace.
C. J. Whatman, Esq.
Arthur Mills Raymond, Esq.

Honorary Members.

Major C. P. J. Elout.
The Hon. J. R. Morrison.
Professor Ippolito Rosellini.

Members who have retired.

Alexander S. Finlay, Esq.
G. F. Travers, Esq.
Capt. W. Dunn.
Lieut.-Col. R. King.
Major-General Evans.
James Johnstone, Esq.

Members whose names have been removed under the provisions of Article LIII. of the Regulations.

Col. Hugh Percy Davison.
Thomas Miln, Esq.
Peter Auber, Esq.

Among the distinguished Members of whom the Society has been deprived by death, the names of Professor Rosellini, the Hon. J. Robert Morrison, Mr. J. Colebrooke Sutherland, Major Elout, and the Hon. George Turnour, are entitled to particular notice.

IPPOLITO ROSELLINI was Professor of Oriental Languages and Antiquities at the University of Pisa. His acquaintance with Egyptian Antiquities and the Coptic Language, led to his being selected in the year 1829 to be a member of a scientific body, deputed by the Grand Duke of Tuscany to investigate the monumental and hieroglyphic remains in the valley of the Nile; and after the death of Champollion, the honourable duty of publishing the results of their united labours was entrusted to him. The magnificent work in which these results were contained began to appear in the year 1832, at Pisa, under the auspices, and at the expense of the Grand Duke, Leopold II. The first issue comprised a series of beautifully executed engravings, accompanied by a volume of descriptive text in Italian; and the whole was preceded by a learned dissertation on ancient Egyptian history, compiled from Herodotus and Diodorus Siculus, with full catalogues of all the dynasties, as preserved by Manetho, Julius Africanus, Eusebius, and Syncellus. From that period, until the decease of the Professor, volume after volume appeared with undiminished interest and splendour, at intervals of little more than a year. The printing of the whole work had not been accomplished at the date of the author's decease; but it is understood that the materials for its completion were left by him in such a state of forwardness, that the small portion remaining will be issued to the public with very little delay. Copies of this beautiful work were regularly presented to the Society by their learned Member, and form a valuable accession to their library. Professor Rosellini was also the author of a practical Coptic Grammar, published at Rome, in 1837; of a Philologico-Critical Letter to Professor Amedeo Peyron, published at Pisa in 1831; and of a Tribute of Gratitude and Affection to the Honoured Memory of G. F. Champollion, Jun., published at Pisa in 1832.

The Honourable John Robert Morrison, Esq., was son of the late Dr. Morrison, the Author of a Chinese Grammar and Dictionary, and translator of the Bible into the Chinese language. He was born at Macao on the 17th April, 1814. He was taken, while an infant, to England, where (with the exception of nearly the whole of the years 1820 and 1821, which he passed at Macao) he resided until he had completed his twelfth year. On his return to China in 1826, he remained for a short time under his father's care; and was then sent to the Anglo-Chinese College at Malacca, where he resided three years, assiduously occupied in the study of the Chinese language, which he afterwards continued under his father's superintendence at Canton.

After the death of Dr. Morrison, his son was appointed Chinese Secretary and Interpreter to the Superintendents of British Trade in China. During the succeeding five years he resided chiefly in Canton, improving his knowledge of the language and customs of China by much study and research, as well as by the exercise of his official duties. In the year 1839 the conflict of Great Britain with the Chinese Empire began; and the services of Mr. Morrison were found invaluable. From that period until his death, Mr. Morrison's time was wholly devoted to the service of his country; and it may not be too much to say that his indefatigable exertions in conducting the diplomatic correspondence of Her Majesty's Plenipotentiary, and in acting as interpreter between the British Authorities and the Imperial Commissioners from the Court of China, both by land and sea, during three expeditions along the coast, contributed to shorten his term of life. He died at the age of twenty-nine, on the 29th of August, 1843, the anniversary of the treaty of peace of Nankin; an event which he ardently desired, and which his exertions essentially aided in effecting.

Mr. Morrison devoted both time and money to the Medical Missionary Society, the Society for the Diffusion of Useful Knowledge in China, and the Morrison Education Society; of all these institutions he was one of the founders, and he acted in each, from their first establishment, as Secretary. He contributed generously to every benevolent association; and expended much money in private benefactions. His death was unfeignedly lamented by numbers of Chinese; and the loss of his services was felt by the English community as a public calamity.

At the period of his decease Mr. Morrison was Member of the Legislative Council of Hong Kong, and Chinese Secretary to Her Majesty's Government in China.

The Honourable GEORGE TURNOUR was a Member of the Civil Service of the Island of Ceylon, and latterly of the Supreme Council. At an early period of his residence his attention was attracted to the ancient vestiges and actual condition of Buddhism on Ceylon; and after mastering the Cingalese language he acquired a knowledge of Pali, as the most effective means of prosecuting his inquiries. The success which rewarded his efforts placed him at the head of this department of Oriental literature, and he has the merit of having first rendered accessible to the public, authentic materials for the history of the origin and progress of the religion of Buddha. His contributions to this subject and to the history of Ceylon, appeared originally in the Ceylon Almanack, a section of which was devoted for a considerable portion of Mr. Turnour's residence in Ceylon, to the literature and antiquities of the island. In this compilation for 1833, was published an Epitome of the History of Ceylon by Mr. Turnour, derived chiefly from the Mahawanso; a work which had for some time occupied his attention, and the translation of which he had commenced in 1826.

Under an impression that a translation of the same work was about to be published in London, Mr. Turnour suspended his labours; but resumed them, on finding that the London publication contained only an inaccurate translation of an imperfect Cingalese version of the original. The first volume of the Mahawanso, containing the text in Roman characters, and Mr. Turnour's translation, was published in 1837. A specimen of his work had been previously circulated, and procured him his election as an Honorary Member of the Asiatic Society of Bengal.

The Mahawanso was composed in the fifth century of our era, and brings down the history of Buddhism, on the continent of India and on Ceylon, to the beginning of the fourth. Different continuations under the same title carry on the history of Ceylon to A.D. 1758. The portion published terminates with A.D. 477, and records many important events in the annals of Buddhism and Ceylon. The subsequent portions are of less value to ancient history; but as they must contain circumstances of importance not only with respect to Ceylon, but the neighbouring peninsula of India, it is highly desirable that the whole should be published. As far as the work given to the world extends, it establishes Mr. Turnour's reputation as a Pali scholar, and as an industrious, careful, and learned investigator of the past history of the Island of Ceylon, and of its national system of religious worship.

The light which the palæographic discoveries of Mr. James Prinsep reflected upon Buddhist history in India, could not fail to excite a lively interest in Mr. Turnour; and accordingly in the year 1835, and for some years afterwards, he was a frequent contributor to the pages of the Journal of the Asiatic Society of Bengal. Besides other contributions, a series of valuable papers occurs in the sixth and seventh volumes, entitled "Examination of Pali-Buddhistical Annals," in which Mr. Turnour describes a number of original works of authority previously unknown. But his most important contribution was comprised in a paper in the sixth volume, on the Tooth Relic of Ceylon, with remarks on the Lât inscription. In this he furnished an identification of the prince by whom the edicts inscribed on the Lât and on the rocks of Dhauli and Girnar were promulgated, and whose name, Piyadassi, had not been met with elsewhere in the writings of either Buddhist or Brahman. A copy of the Dipawanso, a Pali Buddhist work, having been brought to Ceylon from Siam, enabled Mr. Turnour to identify Piyadassi with Asoka, the grandson of Chandragupta, a sovereign of Magadha, in the third century B.C. The identity of these names still rests exclusively upon the authority of the Dipawanso, as cited by Mr. Turnour.

Mr. Turnour's health having been seriously impaired by his protracted residence in Ceylon, he returned to Europe in 1841. After a short stay in England, he was advised to spend some time in Italy. He died at Naples, in the beginning of last year.

Late accounts from India have notified the sudden death of MR. J. COLEBROOKE SUTHERLAND, nephew of the learned founder of this Society. This gentleman was an accomplished Sanskrit scholar; and while engaged in the duties of the civil service, he gave to the world his excellent translations of two important works on the law of adoption, as severally held by the schools of Bengal and Benares,—the Dattaka Mimansa and the Dattaka Chandrika. These are not only interesting accessions to Oriental literature, but are works of the highest authority in the important relation created by that extensively practised and peculiar rite, which gives rise to many and intricate questions before the Courts in India and the supreme tribunal of appeal in this country.

MAJOR C. P. J. ELOUT is well known by his excellent translations into the Dutch and French languages of Marsden's Grammar and Dictionary, which appeared at Harlem in 1824 and 1826. He is also the author of an original Malay grammar of very great value.

The more intimate relations which have recently been established between this country and the great empire of China, naturally excite the most lively hopes that our acquaintance with every subject of interest in the vast and varied regions, and among the singular people of that remarkable portion of Asia, will be largely and rapidly improved. The government of Hong-Kong has been happily confided to a learned and zealous Member of this Society, whose intimate knowledge of the language, and extensive acquaintance with the literature and the people of China, will enable him to direct the researches of the officers under his authority into the most promising fields of inquiry. The Council have not failed to solicit his Excellency's powerful aid in furtherance of the Society's objects in that quarter; and his Excellency has promised them his own exertions, as far as his important avocations will permit, as well as the best application in their behalf of the resources at his command.

A learned Member of the Society having communicated, in a paper lately read at a general meeting, the result of his personal observations and scientific examination of the most remarkable and interesting of the Cave Temples of India, the attention of the Society has been particularly drawn to the present state of some very curious and important remains of ancient Hindu art, which exist in the caves of Ajunta, exhibiting, in a peculiar style of fresco painting, the characteristic forms and appearance of various races, at a period probably antecedent to the Christian era. These singular reliques being in the course of destruction or obliteration, not only by the wear of time, but also by the rough hand and careless treatment of those who occupy, from time to time, the recesses in which they are found, the Council have addressed to the Honourable Court of Directors of the East India Company an earnest request that some competent person may be engaged, under their orders, to make accurate drawings from those ancient paintings, which may preserve faithful memorials of these highly curious remains of the graphic art among the natives of India*.

It has appeared to the Council that some impulse might be given towards a more general interest in the operations of the Society, by occasional meetings being held in the evening, at which topics of general interest, rather than of learned research or abstruse investigation, might be discussed; such especially are those which relate to the developement of the natural resources, and the progress of improvement in the productions of art, and industry, both in our vast Indian possessions and in the Empire of China. Such subjects fall legitimately within the scope of the Society's labours; but the information which may be obtained respecting them would lose much of its value and usefulness if produced at an hour when those to whom it would be of the greatest advantage are preventing from attending by the pressure of other avocations. One evening meeting was held at the close of the last season, and one has taken place very recently, at which information of great interest and value respecting the cultivation of the tea-plant, and the suitableness of the climate of the valley of the Dhoon to its growth, was imparted to a numerous auditory, by Professor Royle and Dr. Falconer. If the feeling of the Society be favourable to the introduction of more frequent evening meetings, on a systematic plan, the Council will take measures for settling the times at which they shall be held, and will make such other arrangements as may be requisite before the ensuing season of 1844-5. It may be thought desirable to hold one more evening meeting in the present season.

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* It is gratifying to state that the representation of the Council has been most favourably entertained by the Honourable Court.

Among the donations to the Society's LIBRARY, the Council wish to advert to the valuable Recueil de Monnaies de la Chine, du Japon, de la Corée, d'Annam, et de Java, by the Baron de Chaudoir, published at St. Petersburgh, in 1842. This valuable work is illustrated by sixty large folio plates, containing representations of more than a thousand coins, ancient and modern, as well as of the various kinds of paper-money which for more than three centuries was the principal circulating medium of the Chinese empire. The plates present not only the current coins, but the numerous medals cast in China by the votaries of Buddha and Tao-tze, which are adorned with mysterious symbols, and are known to be preserved as talismans or amulets, or, at least, as memorials of objects of worship. The text contains a full description of all the coins figured, with many historical details; and also an interesting account of the introduction of paper-money into the empire, and of the causes which led to its depreciation and disuse towards the end of the fifteenth century.

The lithographed edition of the Vendidad Sade, edited by Framji Aspandiar-ji and other Dasturs, and printed in 1842, has been presented to the Society by their Bombay Branch. Of this valuable publication twenty-five copies only were taken off, intended exclusively for presentation to national libraries: the Council may therefore congratulate the Society on its possessing, in this work, a rare, as well as an important volume.

The Council refer with some satisfaction to the Annual Account, which will be found to exhibit a more favourable balance than that of the preceding year by 113*l.* 4*s.* 9*d.*, the sum in hand at the close of 1843 being 291*l.* 14*s.*: to this sum should be added 105*l.*, the yearly donation of the Honourable East India Company, which was not received till January, and therefore too late to appear in the account:—making together a total of 396*l.* 14*s.* A part of this increase, to the amount of 101*l.* 8*s.*, is occasioned by the most desirable of all causes—an increase in the number of subscribing members. A hundred pounds were the generous donation of James Alexander, Esq., which was acknowledged in the report of last year. A diminution of expenditure in printing, caused by some of the lithographic work of the XIVth Number of the Journal having been paid for in the previous year, will account for the rest of the favourable balance now exhibited. Of this comparative improvement, however, the Council are bound to observe, that it must be attributed to contingent, rather than to permanent causes; and that fair scope cannot be given to the beneficial operations of the Society so long

as their limited finances are burdened with the heavy charge of 250*l*. a year, for house-rent. The Council must repeat the expression of their deep regret that a Society, instituted " for the advancement of knowledge in relation to Asia," and honoured by the Royal Patronage, should still be unprovided with accommodation in a public building.

The Council have the high gratification of notifying to the meeting a second munificent donation to the funds of the Society, that since the preparation of this Report has been received from their very generous and much respected friend Mr. James Alexander, the former Treasurer of this Society. Such donations, made for the purpose, as Mr. Alexander has expressed it, "of being applied in the manner that may be deemed best suited to promote the beneficial intercourse between England and India, and to make the wants and the capabilities of each country known to the other," are at once the most honourable testimonials of the giver's zeal in the cause of the Society, and of his confidence in its exertions, and a most seasonable accession to its general resources.

From the Secretary of the Oriental Translation Committee the Council have received the following notice of the proceedings of the Committee during the past year, which they have much satisfaction in submitting to the Meeting. It will be found to afford continued proofs that the labours of that important branch of the Society in the wide field of Eastern learning have in no way relaxed, however inadequate the income of the Fund may be to carry out its objects to the extent desired by Oriental scholars.

The works published by the Committee since the last Anniversary of the Society are the following:—

1. The History of the Mahommedan Dynasties in Spain; Vol. II. Translated from the Arabic of Al-Makkari, by Don Pascual de Gayangos.

This valuable and extensive work, occupying two thick quarto volumes, is now completed, at an expense of upwards of 1300*l*. To the present volume the translator has added many valuable notes, collected from scarce manuscripts in the Bodleian Library, and the collection of Nathaniel Bland, Esq., which compensate for various deficiencies in the original text of Al-Makkari.

2. The Second Volume of Ibn Khallikan's Biographical Dictionary; translated from the Arabic, by Baron MacGuckin de Slane: 700 pages, quarto.

In the Preface to this volume the translator has introduced an interesting inquiry into the course of study and system of mental culture, usually considered necessary, in Mahommedan countries, to form a well-educated Moslim.

3. The third livraison of Histoire des Sultans Mamlouks de l'Egypte; translated from the Arabic by Monsieur Quatremère.

This portion of the work contains the history of the reigns of Mansúr Kaláwún, and of his son Ashráf Khalíl, comprising the period from A.D. 1279 to 1294.

4. The Dabistán, or School of Manners; translated from the Persian, with Notes, &c., by D. Shea, and A. Troyer. 3 vols. 8vo.

More than half a century has elapsed since Sir William Jones directed the attention of the learned to the *Dabistán;* and pronounced it the most amusing and instructive book he had ever read in Persian. Notwithstanding this eulogy, small portions only of the work had hitherto been translated into English; and to the Oriental Translation Committee must be awarded the credit of placing the entire work before the European world.

The translation was commenced several years ago, by the late David Shea, Esq., Assistant Oriental Professor at the East India Company's College, at Haileybury, but whose labours were stopped by death when about a third of the translation had been finished. Mr. Shea's manuscript translation was handed over to Captain Troyer, who undertook to complete the version, at the particular request of the late Earl of Munster, to whose memory the present work is dedicated. Captain Troyer makes honorable mention of the correct state in which he found his predecessor's version, so far as he had carried it; and bringing to the labour an intimate acquaintance with the Sanskrit language, the present translator has been enabled to clear up ambiguities in the text, particularly where it related to Hindu creeds, which might otherwise have been left unexplained. The names of both translators are most favourably known amongst Oriental students; and both have been actuated in their labours by a disinterested zeal for the advancement of Oriental literature rarely surpassed.

The *Dabistán al Mazaheb,* "The School of Sects," is, as this allowable version of the title imports, devoted to accounts of the religious systems of mankind, so far as the compiler was able to collect them. The accounts appear to have been collected with care, judgment, and impartiality; and the work abounds with examples that tolerance is the abstract profession of Eastern sectaries, however contrary to it may be their actual practice. The work seems to have been composed in the beginning of the seventeenth century, and was long attributed to one Mohsan Fani, whose identity, however, has not been satisfactorily established. A carefully revised edition of the text was printed at Calcutta in 1809, under the superintendence of W. Butterworth Bayley, Esq.

Captain Troyer has appended to his translation a learned dissertation on the authorship of the Dabistán, in which the authenticity of that remarkable book the Desatir, and the originality of the Zend writings, are defended with much critical zeal.

Among the translations preparing for the press may be noticed a History of Tipú Sultán, being a continuation of the Nishan-i Haideri; translated from the Persian, by Col. W. Miles; and the Kitab-al Yamíní, containing an account of the conquests of Sultán Mahmúd, of Ghazna; translated from the Arabic by the Rev. James Reynolds, the Secretary to the Committee. The latter work was equally celebrated for its illustrious subject, for the beauty and for the difficulty of the composition. The intricacy of phrase and arrangement which distinguishes this remarkable work discouraged even native scholars, and imposed important obstacles to the efforts of a European translator. But by the liberality of the Committee, the translator has been furnished with the transcript of a Persian MS. version in the Royal Library at Paris; and, by the assistance of this version, it is hoped that the English translation will be shortly completed and published.

The offers which the Committee continue to receive of translations are more numerous than their limited funds allow them to entertain. They, however, have favourably received a proposal from Mr. James Ballantyne, of Edinburgh, of a translation from the Persian of Khafi Khán's History of India,—the *Muntakhab ul Labáb*,—a work highly praised by Stewart, Elphinstone, Erskine, and others, as containing accounts of events occurring in the reigns of Akhbar and Aurangzíb, but little known among Europeans.

The third volume of Professor Flügel's edition of "Haji Khalfæ Lexicon Encyclopædicum et Bibliographicum," is about to be delivered to the Subscribers.

Colonel Sykes read the report of the Auditors on the financial affairs of the Society, as follows:—

Gentlemen, *London*, *4th May*, 1844.

We have the honour to report that in conformity with our appointment we have audited the Accounts of the Society, furnished by the Treasurer, for the year ending 31st December, 1843, and that after carefully examining the books, and comparing the receipts and disbursements with the respective vouchers, we have found them correct. The balance in favour of the Society at the end of 1843 is 291*l.* 14*s.*; and the assets of the Society consist of a sum of 1,942*l.* 17*s.* 1*d.* in 3 per Cent. Consols, exclusive of the value of the Library, Museum, Furniture, &c.

The value of these last-mentioned items has for many years been stated at 3,500*l.* This includes 1,500*l.* for value of copyrights, and stock of the Society's publications, which appears to us considerably to exceed what is reasonable; and we have no means of forming any accurate estimate of the value of the Library and Museum: we consider, however, that they would not be over-rated at 1,700*l.* or 1,800*l.*; and if the Furniture be taken at 300*l.*, the property which it would be prudent to cover by insurance may be estimated moderately at 2,000*l.* Now the actual insurance is only for 1,000*l.*; and we beg to submit to the Council the expediency of adding another 1,000*l.* The additional annual charge would be 2*l.* 5*s.*

We beg also to bring to the notice of the Council the large amount chargeable to the Society on account of house-rent, and other items consequent on the nature of the building occupied by it. We have reason to think that accommodation better suited for the purposes of the Society might be obtained at a lower rent, and of a kind requiring a lower amount of incidental expenses; and, as immediately connected with this matter, we have to state that the third term of the Society's lease will expire at Christmas next; and that if the Council are not disposed to continue the lease for a further term of seven years, notice must be given before Midsummer next.

In conclusion, we beg leave to call the attention of the Council to the very close approximation of the Receipt and Expenditure in the estimate for the ensuing year, notwithstanding that the Receipts accidentally include an extra sum of 105*l.* from the East India Company, which was not paid within the last official year; its place, however, having been supplied by the very liberal donation of 100*l.* from Mr. James Alexander.

We have the honour to be, Gentlemen,
Your obedient humble servants,

HOLT MACKENZIE, } *Auditors on the*
W. H. SYKES, } *part of the Society.*

J. OLIPHANT, } *Auditor on the part of the Council.*

To the President and Council of
The Royal Asiatic Society.

STATEMENT No. 1.

ABSTRACT OF RECEIPTS AND EXPENDITURE, from 1st of January to 31st of December, 1843.

RECEIPTS.	£.	s.	d.	£	s	d
125 Subscriptions of Resident Members for 1843, at 3*l.* 3*s.* each	393	15	0			
55 ditto, at 2*l.* 2*s.* each	115	10	0			
10 ditto, Non-resident Members, at 2*l.* 2*s.* each	21	0	0			
Arrears of Annual Subscriptions paid up	24	3	0			
				£554	8	0
16 Admission Fees, at 5*l.* 5*s.* each	84	0	0			
5 Compositions	84	0	0			
				168	0	0
One Year's Dividend on Consols (less Income Tax)	56	11	10			
Publications sold in 1843	26	0	6			
Annual Payment from Oriental Translation Fund	30	0	0			
Annual Donation from Hon. East India Company*	0	0	0			
				112	12	4
Donation from James Alexander, Esq.				100	0	0
				£935	0	4
In hand at the end of 1842				178	9	3
				£1113	9	7
[£1942 17*s.* 1*d.* in 3 per Cent. Consols.]						

EXPENDITURE.	£.	s.	d.	£	s	d
House-rent, (less Property Tax paid last year)	213	16	5			
Rates and Taxes	46	14	0			
Fire Insurance	2	5	0			
				£262	17	5
Housekeeper's Wages	42	0	0			
Sundry House-charges	25	2	7			
Coals	14	5	0			
Four Dozen Chairs	9	10	0			
Plumber and Glazier	7	4	0			
Carpenter	11	1	0			
				109	2	7
Salaries: Assistant-Secretary, 130*l.*; Clerk, 45*l.*; Porter, 50*l.*; Armourer, 6*l.*				231	0	0
Collector's Poundage				30	0	0
Printer's Bill for Journal, No. XIV.				130	9	0
Stationery, and Sundry Printing	18	0	1			
Bookbinding, 17*l.* 2*s.* 9*d.*; Periodicals, 5*l.* 17*s.*	22	19	9			
Ornamental Diploma	5	5	0			
				46	4	10
Postage and Carriage, 10*l.* 15*s.*; Balance of Secretary's Account, 1*l.* 6*s.* 9*d.*				12	1	9
				£821	15	7
Balance in hand, 31 Dec., 1843				291	14	0
				£1113	9	7

* Received in January, 1844.

STATEMENT No. 2.

ESTIMATED RECEIPT AND EXPENDITURE for 1844.

ESTIMATED RECEIPT.

	£.	s.	d.	£.	s.	d.
Annual Subscriptions and Arrears of Subscription				546	0	0
10 Admission Fees, at *5l. 5s* . .				52	10	0
Compositions				0	0	0
Annual Donation from East India Company	105	0	0			
Ditto, for 1842, not entered in that Year's Account . . .	105	0	0			
Dividend on Consols . . .	56	11	10			
Oriental Translation Fund, for 1844	30	0	0			
Sale of Publications . . .	25	0	0			
				321	11	10
				£920	1	10
In hand, end of 1843 . . .				291	14	0
				£1211	15	10

ESTIMATED EXPENDITURE.

	£.	s.	d.
House-rent and Taxes	250	0	0
House-expenses	100	0	0
Salaries	231	0	0
Collector	30	0	0
Printing Journal and Catalogue	250	0	0
Stationery and Periodicals	45	0	0
Postage, &c.	15	0	0
	£921	0	0
Estimated Balance, end of 1844	290	15	10
	£1211	15	10

When the reading of the preceding Reports was concluded,

NATHANIEL BLAND, Esq., moved, "That the Report of the Council and that of the Auditors, be received and adopted; and that the thanks of the Meeting be given to the Auditors for the attention and efficiency with which they have performed the duty of their office."

Seconded by Dr. ROGERS, and carried unanimously.

Sir GEORGE STAUNTON said he had great pleasure in performing the duty which had been assigned to him, of moving a vote of thanks to their noble President. As one of the original Members of this Institution, and having at all times felt a warm interest in its prosperity and advancement, it had given him pain to observe on some former occasions symptoms of depression and decline; but it was no less gratifying to him to be able, on the present occasion, to congratulate the Meeting on the evidences that had been given of increased vigour and activity in its proceedings since our last anniversary. He felt assured that he only expressed the general sense of the gentlemen present, when he attributed this improvement mainly to the zealous and assiduous attention of our noble President, in personally superintending our affairs. The high station which his Lordship had filled in India, had enabled him to become familiarly acquainted with those various interesting objects of science, literature, and the arts, connected with the East, which this Society was instituted to promote. We now had the pleasure of observing the great interest his Lordship also took in their advancement; and it was fair to expect that his example would excite an additional zeal in this cause in the many other able and qualified individuals who are Members of our Institution.

It must be acknowledged, Sir George observed, that this Society, having for one of its main objects, a purpose of such public and national importance as an inquiry into and development of the resources of that vast Oriental Empire which Providence has placed under British rule; and being, moreover, peculiarly qualified to perform this service, from the constant accession to its Members from amongst those distinguished public servants who annually retire fr m the East to this country, has not yet received that share of public patronage and support to which it is justly entitled. Patronage, it was true, could not create talent; nor was it, perhaps, required in our case, in order to stimulate it into action; but it might contribute very important subsidiary aid to the promotion of the objects to which our attention is devoted. The patronage of the Government and the public might be most beneficially employed in supplying the Society with suitable accommodation for our Meetings, our Library, and our valuable Museum, much of which was now hidden in boxes and in cellars, and thus lost to the public for the want of suitable position for its exhibition. Much of the existing funds of the Society, which was now necessarily devoted to the charge of rent, would be thus set free, and applicable to the purchase of books, the procuring of interesting objects of Eastern art and antiquity, and the general purposes of the Society. Sir George said, in conclusion, that he trusted that the great public utility of an Institution of this character would ultimately force itself into the notice of Her Majesty's Ministers and the public, under the more active administration of its affairs by our present able and distinguished President,—upon whose high character and eminent public services, had he been absent, he would gladly have further enlarged: but out of delicacy to his Lordship, who now occupied the Chair, he could not detain them longer, but simply move, "That the thanks of the Society be given to the Right Hon. the Earl of Auckland, the President, for his Lordship's obliging and assiduous personal attention to the affairs and objects of this Institution, and the warm interest he has displayed in promoting their success."

John Goldie, Esq., seconded this motion, which was carried unanimously.

The Right Hon. the President rose to acknowledge the vote of thanks passed in his favour. He accepted with pleasure this mark of the Society's approval; and he only regretted that he had not done more to deserve it. It would be strange, indeed, if he did not feel interest in the objects of the Society. His impressions of India were too recent, his regard for that country was too warm, and he had too many grateful recollections connected with it, not to be bound to it by affection, as he had been by duty. He looked upon the Society as founded for the better knowledge and for the improvement of all that regarded India; and he could not, therefore, but wish success to its efforts. It was but too true, that he was not competent materially to aid those efforts: he had not those acquirements in language and in literature which distinguished many of his friends near him: but there were branches of inquiry to which he was attached; and, even where he could do little himself, he might, by encouraging and directing the exertions of others, be not altogether useless.

The Report, which they had heard read, was so full and so explicit that it did not require many observations from him; but he might say of it, that if it did not contain throughout matter for triumphant congratulations, it might, at least, be pronounced as satisfactory upon nearly every important point; and the Society may be regarded as standing well—as promising yet further to advance, and carry out all the objects for which it was instituted. Upon all these occasions, the first object of anxiety is that of finance; and here, principally, there may not be matter for exultation; for assuredly our means are narrow, and all must feel that with extended means there would be increased power of doing good—of enlarging and exhibiting our collections—of improving our publications—and of encouraging research. Yet it had in many former years been the duty of the President to announce an excess of expenditure over income; and it was at least satisfactory, on the present occasion, to find that, though small indeed, there had been in the year last past, some excess of income above the outlay incurred; and he was glad to see that there was, in the estimate submitted to the Auditors, a promise of a similar excess for the ensuing year. He lamented that this excess was so small; but there was on the part of the public a growing interest in all that regarded India and the East. It was the duty of the Society, by every exertion, to meet that interest; and he trusted that there would be found, in return, an increased support, marked by additions to their numbers, and that we should receive in the end that assistance and encouragement, to which the Report had alluded, from the Government, in the appropriation of a building to the Society.

With regard to their prospects of receiving this support, he could, with much gratification, assert that in few years had more valuable papers been submitted to the Society than in that year which was under review. He would not do more than allude to the excellent and well-directed labours of the Translation Committee, for those labours were detailed in the Report; but he would rather point to the papers which had been read at their Meetings; and though some great names had been taken by death from their list, and have been gratefully and sadly recorded in the Report, the Society still possessed Professor Wilson, Mr. Fergusson, Mr. Bland, and many others, whose invaluable communications upon the literature and antiquities of the East were fresh in their recollections; whilst in the more practical matters which regard the commerce, the agriculture, and the industry of Asia, in which he himself, from being more conversant with them, had taken the more prominent interest, we might instance the interesting communications received from Drs. Royle and Falconer, and those sent by the Court of Directors, and Board of Control.

They had within the last year tried the experiment of Evening Meetings, at which some of these more practical matters might be treated. The experiment had been eminently successful, and would be renewed. He hoped they would shortly be favoured with a review of the fossil remains of the lower range of the Himalayas from Dr. Falconer. He had received a report on the Grains and Agriculture of Western India, by Dr. Gibson; and, he believed, that a gentleman highly qualified to do justice to the subject, was preparing a paper on the Canals which had been constructed, and were still existing or projected in India, and on their application to irrigation for agricultural purposes. And he had no doubt that by these and similar reports, the interest of these Evening Meetings would be fully kept up. He regretted that the absence of Sir Alexander Johnston deprived them of his valuable report of the proceedings of the Committee of Correspondence; but that department had not been idle; and, more particularly, letters had been written to the new authorities in China, who had evinced a lively interest in the Society, and from whom he trusted that communications of much value and interest might one day be received. Application had been made, as they had heard from the Report of the Council, to the Court of Directors, for procuring drawings of the ancient fresco paintings in the Caves of Ajunta; and although no official reply had yet been received from the Court, he had every reason to believe that the subject was likely to receive a just and highly favorable consideration. He would now conclude by assuring the Meeting that his time and his best exertions were at their command; and that he had the less merit in this, inasmuch as what he felt to be a duty, was equally his pleasure and enjoyment.

The Right Hon. Sir EDWARD RYAN moved, "That the thanks of the Meeting be given to the Director, the Vice-Presidents, and the Council, for the zeal and ability with which they have discharged their important duties in directing the operations, and superintending the affairs of the Royal Asiatic Society during the past year."

LOUIS HAYES PETIT, Esq., seconded the motion, which was carried unanimously.

General BRIGGS moved, "That the thanks of the Meeting be rendered to the Officers of the Society, the Secretary, Treasurer, and Librarian, for the attention they have devoted to the discharge of their several duties during the last year."

This motion was duly seconded; and carried unanimously.

Mr. CLARKE rose to thank the Meeting for the Vote awarded to him. He felt that fully to realise the benefits which this Society was calculated to produce, and which had been so eloquently developed by the noble President, would demand higher qualifications and greater leisure than he could command; but he assured the Meeting that while he would gladly see his place more worthily occupied, yet, so long as his humble services received the kind acceptance with which they were honored by the Council and by the Society, they should be most cheerfully rendered. He desired again to express his high sense of the valuable and ever ready services of his talented and zealous coadjutor, Mr. NORRIS, the Assistant Secretary.

CHARLES ELLIOTT, Esq., in returning thanks, said he wished that the Society's receipts would augment sufficiently to make his office one of much greater benefit; and that he should be most willing to undergo the additional labour which such increase would entail upon him.

JOHN SHAKESPEAR, Esq., returned thanks.

ES said, that it was his agreeable duty to move the thanks to James Alexander, Esq., for a second donation of 100*l*. this Society. He was happy to bear his testimony to the xiety manifested by the late Treasurer to promote the Society, and to the remarkable promptness with which acted upon. It was but a few days ago that, in a con- Mr. Alexander, he had casually alluded to the low state ety's finances, and he had no doubt on his mind that the thus made had produced this additional donation. Mr. as one of the warmest friends of this Institution; and he his good wishes with most efficient measures. He therefore ed, "That the munifice James Alexander, Esq., the late Treasurer of the Royal Asiatic Society, in presenting a second donation of 100*l*. to its funds, is entitled to the warmest and most grateful acknowledgments of this Meeting; and that the Council be requested to convey to Mr. Alexander, on behalf of the Society, the cordial expression of their thanks for his generous gift."

This motion was put from the Chair, and carried unanimously.

JOHN GOLDIE, Esq., and Capt. WM. J. EASTWICK were nominated Scrutineers; and the Meeting proceeded to ballot for the Officers of the Society, and New Members of Council.

At the close of the ballot, it was declared that the Officers of the past year were re-elected; and that Colonel R. Barnewall; the Right Hon. Holt Mackenzie; James Matheson, Esq., M.P.; G. R. Porter, Esq.; Henry T. Prinsep, Esq.; Professor Forbes Royle, M.D.; the Right Hon. Sir E. Ryan; and Lieut.-Colonel W. H. Sykes, were elected into the Council, in the place of the following Members going out by rotation:—Samuel Ball, Esq.; Major-General J. Caulfeild, C.B.; Sir Thomas Edward Colebrooke, Bart., M.P.; Captain Wm. J. Eastwick; John Guillemard, Esq.; Lieut.-Colonel W. Martin Leake; the Honorable W. Leslie Melville; and the Very Reverend the Dean of Salisbury.

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ROYAL ASIATIC SOCIETY.

PROCEEDINGS

OF

THE TWENTY-SECOND ANNIVERSARY MEETING

OF THE SOCIETY,

Held on the 17th of May, 1845,

SIR HENRY WILLOCK, K L.S.,
CHAIRMAN OF THE EAST INDIA COMPANY,
VICE-PATRON,
IN THE CHAIR.

The Honorary Secretary read the Annual Report of the Council, as follows:—

In presenting their annual Report of Proceedings, the Council have the gratification to congratulate the Meeting on the actual condition of the Society, as rather more prosperous than it has been for some years past. On recent occasions they have been contented to state that the diminution of Members has been small; in the year now current there is every promise of an increase in the number of Contributing Members, especially since the commencement of the present session, and consequently of an improvement in the annual receipts; and it is gratifying to add, that they are justified in making a larger outlay; the amount of printing executed in the past year having exceeded what has been put forth for several preceding years.

Twenty-two new Members have been elected, of whom nineteen are Contributing Members, resident and non-resident; and three are Corresponding Members. Their names are as follow:—

Contributing Members, resident and non-resident.

1. G. W. Anderson, Esq.
2. T. P. B. Biscoe, Esq.
3. Wm. Wilberforce Bird, Esq.

4. Albemarle Bettington, Esq.
5. Major-Gen. William Cullen.
6. Col. Thos. Dickenson.
7. The Lord Francis Egerton.
8. Dr. Hugh Falconer, F.R.S.
9. William S. Gillett, Esq.
10. Robert Garstin, Esq.
11. Sir Henry Hardinge, K.C.B.
12. The Rev. F. Hessey, LL.D.
13. The Rev. C. W. Ireland Jones.
14. Captain John Lewis.
15. Major-Gen. W. Morison, C.B., M.P.
16. J. R. Stoop, Esq.
17. Frederick Schönerstedt, Esq.
18. Lieut. Thos. Waghorn, R.N.
19. Major Thomas Wilkinson.

Corresponding Members.

1. Robert Thom, Esq., H. B. Majesty's Consul at Ningpo.
2. Captain Balfour, H. B. Majesty's Consul at Shanghae.
3. Francis C. M'Gregor, Esq., H. B. Majesty's Consul General in China.

Six gentlemen have retired from the Society since the last Anniversary, and five have died; their names are as follow:—

Retired.

1. Thomas Law Blane, Esq.
2. Alexander D. Campbell, Esq.
3. Benjamin Harding, Esq.
4. Colonel C. M. Roberts.
5. Colonel H. T. Roberts.
6. Timothy Tyrell, Esq.

Dead.

1. John Blackburne, Esq.
2. J. L. Guillemard, Esq.
3. Dr. John G. Malcolmson.
4. The Right Hon. Sir Gore Ouseley, Bart., V.P.
5. James Ritchie, Esq.

Among the names which have just been read is one which will awaken the most lively sympathies of the Society,—it is that of their venerable, accomplished, and amiable Vice-President, SIR GORE OUSELEY. As one of the most prominent among the founders of the Society, and of the most active of its friends, and, while health continued, among the most regular in his attendance at our sittings, his loss will be long and deeply felt; and more especially will the privation of his support and counsels be experienced in that branch of the Society's labours, the Oriental Translation Fund, over which he had presided from its earliest establishment.

The Council have learned with much satisfaction that a Memoir of this distinguished person, whose services had been employed for the benefit of his country in various regions of the world, and whose name is familiar to the learned of Europe and of Asia, is preparing by the Rev. and learned Secretary of the Oriental Translation Fund, and will be enriched with valuable materials from private as well as from public sources. The Council will not lessen the interest which this announcement will awaken by attempting an imperfect biographical sketch, but will limit themselves to the expression of their high respect for the varied attainments, their gratitude for the services rendered to this Society, and their affectionate regard for the memory of their late Vice-President, Sir Gore Ouseley.

The next name which presents itself as entitled to special notice on this occasion is of another of the earliest associated founders of the Royal Asiatic Society. John Guillemard, Esq., was descended from a highly respectable French Protestant family, which took refuge in England on the occasion of the revocation of the Edict of Nantes. He was a gentleman of very considerable literary and scientific attainments; and was endeared to a very large circle of friends and acquaintance, (including most of the distinguished men of his time, not only in England, but on the Continent of Europe and the United States of America,) by his many amiable and social qualities, and the enlightened benevolence of his character. He had accumulated, in the course of a long life, large stores of information, derived from study, travel, and intercourse with mankind; and these stores he imparted in conversation, with the happiest facility, to all who enjoyed the pleasure and advantage of his society. His zeal and energy in the pursuit of knowledge, and the investigation of the latest discoveries in science, were very remarkable; and they suffered little abatement from the infirmities of his advanced age, until within a very short period of his decease.

Although not himself an Oriental scholar, he took a warm interest in all those Oriental inquiries which this Society was instituted to promote. He was one of its earliest Members, and frequently served upon its Councils; he was, in fact, a distinguished representative of that very essential class of our Members, who, without having any local or personal connection with the East, are induced, by their enlightened taste and patriotic feelings, to join this Institution for the purpose of giving all the aid and encouragement in their power to the valuable labours of their more qualified associates.

After receiving a liberal education at St. John's College, Oxford, in which University he proceeded to the degree of Master of Arts, and spending two winters at Edinburgh in attending lectures, and in the society of Dr. Black, Dugald Stewart, and other eminent men of science of that day, Mr. Guillemard passed several years in travels on the continent of Europe and in the United States of America. In the latter country he formed an intimate acquaintance and friendship with the late Duke de la Rochefoucault Liancourt. This amiable and illustrious French nobleman, in the Preface to the published account of his American Travels, specially mentions the pleasure and advantage he had derived from Mr. Guillemard's society during his tours.

While Mr. Guillemard was in America, a Commission was appointed under the Treaty of Peace between Great Britain and the United States, for the settlement of the claims of the American Loyalists. It consisted of an American Commissioner, a British Commissioner, and a third Commissioner, who was to be chosen by an agreement between the contracting parties. This latter appointment was conferred, quite unexpectedly, and without solicitation, upon Mr. Guillemard, and is a strong evidence of the high opinion entertained on both sides of his impartiality and integrity. His attendance upon the duties of this office for some time gave him considerable occupation; but during the latter years of his life he enjoyed an honorable leisure in the midst of the literary and scientific circles of this Metropolis, and was a frequent attendant at the Meetings of all the principal learned Societies. He officiated for some time as Secretary of the Royal Institution, and was a constant and zealous supporter of that important scientific establishment. He was also a Magistrate and Justice of the Peace for the County of Essex, in which he possessed considerable property.

He died at his house in Gower-street, on the 22nd of November last, in the 81st year of his age; and left a widow (a sister of the late amiable and distinguished President of the Royal Society, Mr. Davies Gilbert) to lament his loss.

Dr. John Grant Malcolmson entered the East India Company's service in 1823. He served in nearly every part of the Madras Presidency, and in the provinces beyond the Ganges, and was everywhere distinguished for attention to his professional duties, kindness to the men entrusted to his care, and the indefatigable pursuit of every branch of natural history. His pen was frequently employed in registering the results of his labours; and although he did not hastily publish his observations, many valuable papers appeared from time to time in the scientific journals of India and this country. In the year 1832, he obtained the prize of 500 rupees offered by the Government for the best essay on the disease called Beriberi, and on the Rheumatism, which is often a sequel to that disease. In awarding the prize, which was gained over competitors of no ordinary merit, the Board bore testimony to the indefatigable zeal of Dr. Malcolmson, as well as to the original and comprehensive views displayed by him in the Essay. Soon after this period he was appointed Secretary to the Medical Board, the duties of which office he continued to discharge until 1835, when illness compelled him to return to Europe, a journey which he accomplished by the then unaccustomed route of Mocha and Cosseir; making large geological collections on his way, and pursuing some interesting investigations into the saline constitution of the Red Sea, the results of which appear in the Society's Journal.

During his residence in England he determined to retire from the Company's service, with a view of becoming a member of the mercantile house of Forbes and Co., Bombay. He left London in the Spring of 1840; and in the very short time allotted him in Egypt, he pursued his investigations into the extraordinary petrified forest near Cairo, which has not sufficiently excited the attention of geologists. He reached Bombay in the month of June; and was admitted a member of the house of Forbes and Co. Two years after this date he became Secretary to the Bombay Branch Royal Asiatic Society. He was indefatigable in arranging its library, increasing its museum, and improving its journal, both by his zeal in editing it, and by his valuable contributions to its pages. In 1843, he took a scientific excursion of considerable extent into the interior, in the course of which he came to the conclusion that the arid mountain ranges which now intersect India, hardly affording sufficient moisture for the preservation of animal life, must have exhibited at some former period, "vast plains of fresh water lakes and and marshes, on the muddy shores of which multitudes of gavials, crocodiles, and tortoises must have preyed, and amidst the rank luxuriousness of the bordering vegetation, the mastodons, hippopotami, bisons and sivatheria, must have ranged, whose bones are now found so abundantly scattered over India."

Early in February 1844, he proceeded on another scientific tour, with the object of perfecting these enlarged views, during which incautious exposure to malaria brought on jungle fever. On the 27th he was seriously ill; but he rallied slightly, and proceeded to Dhoolia, which he reached on the 22nd of March, where he died on the evening of the following day.

Dr. Malcolmson has been characterised by the geologist Miller as "possessing, in a remarkable degree, the spirit of research which invariably marks the superior man;" and he is lamented by his friends as a man of mild demeanour, warm heart, and open liberality.

The following list of his publications affords but an inadequate idea of the attainments of Dr. Malcolmson; but it is believed that he left materials of great value in manuscript, which it may be hoped that the enlightened zeal of his friends will arrange and communicate to the world.

On a remarkable Aerolite, 1831.

On the Saline Formations around Hyderabad. Bengal Journal, 1833.

Practical Essay on the History and Treatment of Beriberi, Madras, 1835.

On the Saltness of the Red Sea. Journal of the Royal Asiatic Society. 1837.

On a Peculiar Symptom in some Cases of Enlarged Liver. Lond. Med. and Chir. Trans., 1838.

Clinical Remarks on some Liver Cases. Edin. Med. and Surg. Journal, 1839.

Review of Works on Bronchocele. Brit. and For. Med. Review, 1839.

On the Fossils of the Eastern Portion of the Basaltic District of India. Trans. Geol. Soc., 1840.

On the Effects of Solitary Confinement on the Health of Soldiers, 1840.

It may not be thought unfitting that to the melancholy list of these most valuable members of the society who have in the year under review been taken from us, and who have most justly been mentioned with honor, the Council should add the name of William Griffith, whose death at Malacca, on the 9th of February last, has been announced by the last Mail from India, and whose loss will be a subject of deep sorrow to all who either regard the general interests of science, or the local and particular interests of India, and above all, to those who were personally acquainted with him, and could appreciate his great acquirements and his admirable qualities.

Mr. Griffith was one of the most accomplished botanists of our day; with the most accurate and extensive acquisition of learning in his department, he combined a spirit of activity and enterprise, such as has been rarely equalled, great talents, and a very remarkable power of labor, arrangement, and application. He was born in the year 1810, and was educated at the London University. He went out to India, as an assistant-surgeon on the Madras Establishment, where he arrived on the 24th September, 1832, and was shortly afterwards selected by the Bengal Government for the examination of the botany of the Tenasserim Provinces. He was, in 1835, deputed to Assam, with Dr. M'Clelland, for the purpose of assisting Dr. Wallich in his inspection of the growth of the Tea plant in Assam, and from thence he proceeded, in company with Dr. Bayfield, to the then unexplored tracts which lie between Suddiya and Ava, upon the extreme frontier of our Eastern territory. In 1837 he accompanied Captain Pemberton on his mission to the wild countries of Boutan. In 1839 he was sent, with the army of the Indus, to prosecute inquiries into the botany of Affghanistan. In 1841 he was appointed to the medical duties of Malacca. In 1842, upon Dr. Wallich's absence, from illness, at the Cape, he was intrusted with the superintendence of the Botanical Garden at Calcutta, and with the duties of the Botanical Professor in the Medical College; and, upon the return of Dr. Wallich from the Cape, he resumed his place at Malacca, where he was seized with disease of the liver, and died at the early age of thirty-four, having already acquired a distinguished reputation,—having in every capacity in which he served the Government received its approbation and its thanks; and having given a promise of such further services to botanical science as few have had either the opportunity or the talent of affording. In all his varied and extensive journeys, his courage and his energy never failed him; whether in the jungles of Assam, or the hills of Affghanistan, he still pursued his researches, undeterred by danger, either of disease or of violence; and if disabled, as he was more than once by fever and debility, his first convalescence found him ever ready for fresh exertions. He had thus, by the application of extraordinary powers of observation, and in perquisitions extending through the vast regions which have been enumerated, formed large and valuable collections, and brought together materials for a great botanical work; and he looked with impatience to a period of repose for compiling a Scientific Flora of India, when he sunk under his last fatal illness. Perhaps no more impressive picture of the energy of this extraordinary man, and of his devotion to his favorite science, can be given than that which may be drawn from the following extracts from a letter which was dictated by him on his death-bed, and addressed to Dr. M'Clelland :—

"I write this by deputy, being seriously ill of hepatitis; the attack has been very severe, and the treatment necessarily active, so that I am reduced to an extreme state of weakness. Although my adviser does not despair, still the issue is doubtful, and under this impression I commence a few lines to you on business.

"Mrs. Griffith (supposing the result of this illness to be fatal to me) will bring up with her all the collections at Malacca, and they being added to those at the export warehouse, and all having been previously cleaned and packed, I leave to you to present to Government, for the Honourable Court of Directors, to be sent home without any delay. As you know the trouble I have taken with these collections, and the hopes I had of making them subservient to a general scientific Flora of India, I need not impress on you how much I am interested in their proper disposal, and their being brought properly before the scientific public; and I would say the same regarding my drawings and manuscripts, which will accompany my wife to Calcutta, should it so happen that I leave her.

"In all the plans which I have consigned to your execution, both regarding my wife and collections, I am confident your own feelings will prompt you to every exertion on my account. Asking God's blessing on you and your wife, I bid you good bye."

"Thus far," continues Dr. Moorhead, his medical attendant, "was written at Mr. Griffith's dictation, but I grieve to say the fatal result came to pass yesterday evening, Sunday, 9th February, at half-past seven o'clock."

Memoranda on the above by Dr. M'Clelland.—"To the above details, furnished by Dr. Moorhead, I may remark that Mr. Griffith's constitution for the last two or three years seemed greatly shattered, his energies alone remaining unchanged. Exposure during his former journeys and travels laid the seeds of his fatal malady in his constitution, while his anxiety about his pursuits and his zeal increased; he became care-worn and haggard in his looks, often complaining of anomalous symptoms marked by an extreme rapidity of pulse, in consequence of which he had left off wine for some years past, and was obliged to observe great care and attention in his diet. In Affghanistan he was very nearly carried off by fever, to which he ect on his former travels in Assam. No government ever had l or zealous servant, and I impute much of the evil conse- health, to his attempting more than the means at his disposal accomplish with justice to himself."

Mr. Griffith's researches were directed primarily to Botany, o opportunity, during his visits to various parts of India, of to other departments of Natural History. Of his zeal and logy, the collections which he made afford abundant proof; ist iefly of mammalia, birds, fishes, and insects. While attached army of the Indus, he made, on account of Government, large collec- f mammalia and birds, which have been transmitted to the Honour- Court of Directors, and h constitute a valuable addition to the museum at the India House. In mammalogy he collected a considerable number of the smaller animals of Affghanistan, among which are several new to science; but his ornithological collections are more extensive, having brought together about six hundred specimens, not only from the route of the army, but from several separate excursions to the ranges of mountains north of Cabul. Besides the discovery of a considerable number of new species, the interest of these collections consists in their affording, perhaps, the most extensive and instructive illustration of the geographical distribution of the several species of birds found in India, which has as yet been attempted.

Mr. Griffith has also been zealous and successful as a collector of the fresh water fishes of India, during his various travels: the importance and extent of these is detailed in a paper on the subject, printed in the second volume of the Calcutta Journal of Natural History; and some of his discoveries in Entomology have been communicated to the public by the Rev. F. W. Hope, in the eighteenth volume of the Transactions of the Linnæan Society of London.

He was most especially remarkable for the philosophical spirit in which he invariably prosecuted his researches, and for the patience with which he watched the most minute phenomena which appeared to him connected with the subjects of his investigation. Some of his published papers, especially those on Vegetable Impregnation, and the Progressive Development of Organs, have never been excelled and rarely equalled.

The merits of this accomplished naturalist and devoted labourer in the field of scientific discovery, were appreciated and fostered by the noble President of this Society while at the head of the Government of India, and it is to his Lordship's kindness that the Society are indebted for some of the most interesting parts of the foregoing communication. His loss has also been recently noticed in terms of deep regret by the present Governor-General, Sir Henry Hardinge, in His Excellency's Address at the annual distribution of honors and prizes at the Bengal Medical College.

As it is understood that the whole of the valuable materials prepared and collected by Mr. Griffith are consigned to the Directors of the East

India Company, the most confident hopes may be cherished that the expectations of the scientific world will not be disappointed of the full benefit which they are calculated and were intended by him to confer on botanical and zoological knowledge, and that the irreparable loss entailed on his widow by his early death, and the sudden extinction of all those hopes of fortune, honour, and reward, which his extensive knowledge and indomitable energy were so well calculated to raise, will meet with such alleviation as, to the enlightened liberality of the Honorable Court, the great value of his labours, and the forlorn and ill-provided state of his widow and family, may be considered to merit.

In the course of the present session, two remarkable and important additions have been made to our stores of historical evidence, and to the means of accurately ascertaining the powers of hitherto imperfectly known forms of ancient writing.

The first of these valuable acquisitions is a transcript, which may now be pronounced nearly perfect, of an inscription at Kapur di Giri or Shah Baz Ghari, near Peshawar, of which only partial and mutilated fragments had been before obtained. With laudable zeal and judicious perseverance, Mr. Masson performed the task of tracing the letters cut in the face of the rock, by covering the surface with a black preparation, and thus leaving in blank the cavities by which the letters were formed. The pieces of cotton on which the impressions were thus taken, having been all placed at our disposal by Mr. Masson, together with written copies which he had made of the whole inscription, the work of transcription from them was undertaken by Mr. Norris, the Assistant Secretary, who, with indefatigable industry, minutely examined and compared every letter, collating several duplicate fragments, and referring to all the corroborative evidence that could be obtained from other copies of parts of the inscription; the result has been that a faithful and legible transcript has been made and accurately reduced; the alphabet of this hitherto imperfectly known character has been completed, and the inscription itself is now under the consideration of our learned Director, and will very shortly be laid before the world with his translation and remarks. It may in the mean time be interesting to the Meeting to learn that the inscription is of much greater extent than was first supposed, and that the subject matter is intimately connected with that of the Girnar and Dhauli inscriptions which have been deciphered and translated by the lamented James Prinsep.

The second very valuable communication which the Society has received, is from Major Rawlinson, now residing at Baghdad, who, in the year 1839, had made known to us the fact of his having succeeded to a great extent, in reading and analysing some important inscriptions on a rock in Bisitun or Bihistun in ancient Media, written in the cuneiform character, and containing a record of the genealogy and historical events of the reign of Darius the son of Hystaspes. The most lively interest was excited by

time submitted by Major Rawlinson, and proportionate
as experienced by the delay which the occupations of
in high political duties had interposed in the fulfilment of
nd home a complete version of those inscriptions. Greatly
Council rejoiced at learning from the Director, that this
had now been enabled to render his labors so far com-
se their publication in the Society's Journal. He is
should be presented entire to the public, with the fac-
ritical, historical, and grammatical notices which he has
ompany and illustrate them. The Council have assured
of their anxious desire to meet his wishes in every point
hope to receive from him,
will prepare for publication, without any avoidable delay,
interesting and important papers which he is about to entrust to

Council have again to notify the munificent liberality of their late
rer, who, ever mindful of the inadequacy of the Society's resources to
ish the purposes for which it is associated, and generously resolved to
most convincing and beneficial proof of the deep interest he feels in
se, has now, for the third time, presented to us a noble donation of
ndred pounds. Of this sum it is Mr. Alexander's wish that one half
pplied to the general purposes of the Society, and that the other moiety
be expended in the purchase of books. To this appropriation of a part of his gift he has been led by the consideration of the actual state of the library, which, though possessing many works of high value, and some of great rarity, is particularly deficient in books of reference, and in many other works which our shelves ought to contain for the use of the Members, whether engaged in the search for information on subjects connected with the East, or which they may require to consult when preparing to impart, through the Society's instrumentality, the results of their own investigations. In the pursuit of such objects great disappointment would at present be experienced from the incompleteness of our collections, which have solely accrued from the liberal donations of friends giving or bequeathing many such books as a library of the Royal Asiatic Society should possess; but the limited extent of the funds at their disposal has never enabled the Council to provide for the systematic enlargement of our collection, or its completion in any one branch of Eastern study or research.

The Council cannot avoid expressing a hope, on this occasion, that the example set by their esteemed friend and former Treasurer of providing for the extension of the Society's library, may be followed by others of its Members and supporters, either by the presentation of works now deficient, or by placing at the disposal of the Council the means of procuring them, by special donations for that purpose.

Neither can the Council omit here to express their sense of great obligation to the many learned Societies and individual authors, both in this country and abroad, whose valuable publications constitute an important portion of the Society's present store of literary works; and they rely with full confidence on the continuance of the same liberal spirit, to supply the Members of this Society with the latest information on all that can interest and inform in knowledge and discovery connected with the subjects of the Society's researches.

Among the DONATIONS received since the last Anniversary, the Council has the pleasure to announce a valuable collection of Chinese works, presented by Samuel Ball, Esq., most of which are new to the Society's library. Among these are some important statistical works, believed to be unique in Europe. The addition of these books, and of some other recent donations, to the Chinese Library of this Society, renders it one of the most extensive and valuable of European collections in this branch of literature.

The diligent labors exerted in the investigation of Zoroastrian learning at the same time in different quarters of the world, and the munificent liberality exhibited in the printing and presentation of the sacred books of that religion, have enriched the Society's library with the lithographed edition of the Yaçna and Vispard of the Parsís, edited by Framji Aspandiarji, and other Dasturs, presented by the Bombay Branch Royal Asiatic Society, in addition to the Vendidád, previously given by the same learned body. And the Society have likewise to acknowledge the donation of the splendid French edition of the Vendidád Sadé, of which the concluding numbers have been recently presented by Monsieur Burnouf, the learned editor.

There have been received from the American Oriental Society of Boston the first numbers of the Journal issued from the press of that body, whose institution and progress have been witnessed with much gratification by all those who are interested in the investigation of the antiquities and literature of the East. An earnest wish to co-operate on all matters of mutual interest has been expressed by the American Society, which has been cordially responded to by the Royal Asiatic Society.

The Council advert with much interest to the commencement of a valuable work by Mons. Burnouf, of which they have received the first portion, on the History of Buddhism in India; and they look forward with great expectation to the results which may follow from the extensive investigations of the learned author.

The Council notice with much pleasure, among the works presented to the library, a History of the Pearl Fisheries of Ceylon, by J. Steuart, Esq., illustrated with valuable drawings done by hand; the Chinese and English Dictionary of Mr. Medhurst—a convenient abridgment of Morrison, with some beneficial changes in the arrangement of words; and a copy of the great Dictionary of the Armenian Language, printed at the Armenian College of Venice.

f Sir Gore Ouseley has caused a vacancy in the number of which it will be for the Meeting to fill up. The Council at they have only anticipated the general feeling of the nating for your election a learned person, who for many istinguished position of Chief Justice of the Supreme Court yet more, in reference to the objects for which this Society ho long presided over the Asiatic Society of Bengal. The ich that eminent person has always manifested in whatever welfare of India, and the advancement of knowledge in all that er history, antiquities, and science, and the kindness with which st year consented to bear a part in the deliberations of the Council, ctly point out Sir Edward Ryan as peculiarly entitled to the office for which he is this day proposed.

The Council have been furnished by the Secretary of the Oriental Translation Committee with the following notice of the proceedings of that body, which they doubt not will be received with interest by the Society.

In the Committee's review of the past year, a tribute, however brief, of respect to the memory of its deceased Chairman, the Right Hon. Sir Gore Ouseley, is naturally called for from the members of the Committee, and is feelingly awarded. To Sir Gore Ouseley, jointly with the late Earl of Munster, the Oriental Translation Fund owes its foundation; and both these sincere friends to Oriental learning were equally unremitting in their exertions to promote its stability and success.

Sir Gore Ouseley, although his clear understanding and correct taste would have enabled him to use his extensive information to the best advantage, and would have probably ensured him success in any literary exertions, left no published compositions to the world. The Committee, however, have the melancholy satisfaction of announcing that they will shortly publish an interesting work, which their late Chairman, at the time of his decease, was actively engaged in preparing for the press. The book was originally entitled:—"A List of Thirty-One Persian Compositions; with Critical Remarks of Native Reviewers, and Biographical Notices of the Authors," and was inscribed by the Author "To his Friends and Colleagues of the Oriental Translation Committee." A Memoir of Sir Gore, drawn up by the Secretary of the Committee, chiefly from materials furnished by the obliging kindness of Lady Ouseley, will be appended to the work. It is to be regretted that the Right Honourable translator had not completed the whole of the number of notices he had proposed to himself; but as each article is separate and distinct, the work, though small in size, is complete, so far as it extends.

The two books published by the Committee since the last annual meeting of the Society, are, the third volume of Professor Flügel's great work, "Haji Khalfæ Lexicon Encyclopædicum et Bibliographicum;" and Colonel Miles's translation of "The History of the Reign of Tipú Sultan, being a continuation of the Nishani Haidari, written by Mir Hussein Ali Khan Kirmani." Another volume of Haji Khalfa's Lexicon; and a moiety of the third volume of Baron Mac Guckin de Slane's translation of Ibn Khallikan's "Biographical Dictionary of Illustrious Men of Islâmism," will shortly be presented to the public; as will also a portion of Baron Hammer-Purgstall's translation from the Turkish of "The Travels of Evliya Effendi."

Among the works recently offered for printing under the auspices of the Committee, are two deserving of especial notice. The first is, an extensive collection of Biographies of Persian Poets, proposed by Nathaniel Bland, Esq. The other is a translation of "The Book of Religious and Philosophical Sects," from the Arabic of Sharistání, a Mahommedan writer of the twelfth century, by the Rev. W. Cureton, the able editor of the original text of the work which is now in course of publication by the Oriental Text Society. The work of Sharistání, in an English dress, will form a fit companion to that curious and instructive book, the Dabistan, or "School of Sects," published last year by the Committee; and will doubtless open to the English student additional stores of information on the theology and philosophy of Eastern nations to those already furnished him through the medium of the Oriental Translation Fund; and for which the Committee trust they have established a merited claim on the earnest support of the many liberal patrons of literature in this country.

A translation from the Chinese, by that accomplished scholar the Rev. W. H. Medhurst, has also been submitted to the Committee; and has received their favourable attention. It is entitled, "An Account of the Malayan Archipelago; containing a statistical and historical view of the Eastern Islands, and particularly of Java; by Ong-tae-hae, a native of China."

The ORIENTAL TEXT SOCIETY has during the year effected the publication of the Makhzan al Israr, a poem by Nizami, which has been edited by Mr. Bland; and has continued its assistance to the Biographical Dictionary, the Takzib al Isma, edited by Mr. Wüstenfield, of which five parts are now published. It is expected that the work will be finished in the course of the year.

The second volume of the Sharistání, edited by Mr. Cureton, is nearly ready for publication; and the Yusuf and Zuleikha, of Firdusi, by Mr. Morley, has been commenced.

In Sanskrit, the printing of the Dasa Kumara Charita has been commenced, under the superintendence of Professor Wilson.

GENERAL BRIGGS read the Report of the Auditors as follows:—

GENTLEMEN, *Grafton Street, 2nd May*, 1845.

In pursuance of our appointment as Auditors of the Society's Accounts for the year 1844, we have this day examined the books of the Society, comparing them with the vouchers of the receipts and disbursements; and we have the pleasure to report their correctness.

The abstract, Statement No. 1, furnished to us by the Treasurer, shows the receipt of the year 1844 to have been 998*l.* 1*s.* 10*d.*, to which must be added the sum of 291*l.* 14*s.*, the balance in the Society's favor at the end of 1843, making a total of 1289*l.* 15*s.* 10*d.* The total expenditure of the year was 912*l.* 14*s.*, leaving a balance in the Society's favor, on the 31st December, 1844, of 377*l.* 1*s.* 10*d.*, exceeding the balance at the end of 1843 by 85*l.* 7*s.* 10*d.*

It must however be observed that these totals do not precisely represent the transactions of the year, because the actual receipts are increased by the accidental circumstance of the East India Company's donation for 1843, as well as that for 1844, having been received in the latter year; and they are diminished by the non-receipt in the course of the year of the annual contribution of 30*l.* from the Oriental Translation Fund, which will come into the account of 1845.

The proper totals of the year would be:—

Receipts, including the preceding year's balance	£1214	15	10
From which deducting expenditure . . .	912	14	0
The balance remaining would be for 1844 . .	£302	1	10
Exceeding the balance in hand at the end of 1843 by	£10	7	10

The assets of the Society remain as heretofore, namely, 1942*l.* 17*s.* 1*d.* in the 3 per cent. Consols; and the value of the Library, Museum, Furniture, &c. in the Society's House.

JOHN BRIGGS, } *Auditors on the*
R. BARNEWALL, } *part of the Society.*

WM. J. EASTWICK, } *Auditor on the part of the Council.*

To the President and Council of
The Royal Asiatic Society.

STATEMENT No. 1.

Abstract of Receipt and Expenditure from 1st of January to 31st of December, 1844.

RECEIPTS.

	£	s.	d.			
125 Subscriptions of Resident Members, at 3*l.* 3*s.* each	393	15	0			
56 ditto, at 2*l.* 2*s.* each	117	12	0			
7 ditto, Non-Resident Members at 2*l.* 2*s.*	14	14	0			
Arrears of Annual Subscriptions paid up	18	18	0			
				544	19	0
12 Admission Fees, at 5*l.* 5*s.* each	63	0	0			
1 Composition	21	0	0			
				84	0	0
One Year's Dividend on Consols (less Income Tax)	56	11	10			
Publications sold	2	11	0			
Annual Donation from East India Company for the years 1843 and 1844	210	0	0			
Donation from James Alexander, Esq.	100	0	0			
				369	2	10
Total Receipt in 1844				£998	1	10
In hand, end of 1843				291	14	0
£1942 17*s.* 1*d.* in 3 per Cent Consols.				£1289	15	10

EXPENDITURE.

	£	s.	d.			
House Rent, One Year (less Property Tax)	213	16	5			
Rates and Taxes	34	8	4			
Fire Insurance	2	5	0			
				250	9	9
Housekeeper's Wages	48	0	0			
Sundry Charges, per Housekeeper	30	12	3			
Coals, 16*l.*; Painter and Glazier, 22*l.* 8*s.*	38	8	0			
Ironmonger's Bill	1	9	0			
				118	9	3
Salaries of Assistant Secretary, Clerk, Porter, and Armourer	231	0	0			
Collector's Poundage	31	0	0			
				262	0	0
Printer's Bill for Journal, No. XV., Parts 1 and 2	185	13	6			
Sewing Journal, &c.	12	9	8			
Paper in Journal	16	16	0			
				214	19	2
Books and Periodicals	9	18	6			
Stationery and Sundry Printing	18	15	1			
Bookbinding, 8*l.* 5*s.*; Picture Frames, 1*l.* 10*s.*	9	15	0			
Postage and Carriage	14	2	7			
Miscellanies	14	4	8			
				66	15	10
Total Expenditure in 1844				£912	14	0
Balance in hand, 31 Dec., 1844				377	1	10
				£1289	15	10

STATEMENT No. 2.

ESTIMATED RECEIPT AND EXPENDITURE for 1845.

ESTIMATED RECEIPT.	£	s.	d.
From Annual Subscriptions and Arrears	550	0	0
Admission Fees, 15 at 5 guineas each	78	15	0
Compositions	0	0	0
Annual Donation from East India Company	105	0	0
Dividends on Stock in 3 per cent Consols	56	11	10
Annual Payment of Oriental Translation Fund for 1845	30	0	0
Ditto, for 1844 (not received in that Year)	30	0	0
Sale of Publications	25	0	0
Donation from James Alexander, Esq.	100	0	0
	£975	6	10
Add Balance in hand, 31st December, 1844	377	1	10
	£1352	8	8

ESTIMATED EXPENDITURE.	£	s.	d.
House-rent and Taxes	**250**	**0**	**0**
House-expenses	**100**	**0**	**0**
Salaries	**231**	**0**	**0**
Collector's poundage	**29**	**7**	**6**
Printing Journal	**200**	**0**	**0**
Books and Periodicals	**10**	**0**	**0**
Stationery and Sundry Printing	**20**	**0**	**0**
Bookbinding, &c.	**10**	**0**	**0**
Postage and Carriage	**15**	**0**	**0**
Miscellanies	**15**	**0**	**0**
Moiety of Mr. Alexander's donation to be expended in Books	**50**	**0**	**0**
	£930	**7**	**6**
Estimated Balance in hand, 31st December, 1845	**422**	**1**	**2**
	£1352	**8**	**8**

After the reading of the foregoing Reports,

Sir Ralph Rice said that he rose with great satisfaction to move that the Reports which had now been read should be received. He had listened with deep interest to the notices of the eminent and distinguished persons who have been recently removed from the list of our associates; and had been particularly touched by the feeling manner in which the loss of our late accomplished Vice-President, Sir Gore Ouseley, was lamented. For himself, he knew no one in whom a high, gentlemanly bearing, and the readiness of kindly intercourse, were more completely united with sound learning, and extensive information, than in Sir Gore Ouseley. Though not personally acquainted with the other gentlemen named, he could estimate the value of such services as they had rendered; and he deplored their loss. Great indeed were the advantages produced in India by the influence of those whose talents and exertions are recorded in the Report just read. Happily for the interests, both of India and of England, the labours and discoveries of such men could be made speedily known by the facilities of communication now existing between Asia and Europe; and while valuable additions were made to our own stores of knowledge, a more general interest, it may be hoped, was being exerted in this country in favour of India, its productions, its history, and its people.

Sir Ralph Rice concluded by moving:—

"That the Reports of the Council and of the Auditors be received and adopted; and that the thanks of the Meeting be given to the Auditors for their attention to the interests of the Society, and the efficient discharge of the duties of their office."

Seconded by **Sir Herbert Compton**; and carried unanimously.

The **Honorary Secretary** read the following letter which he had received from the **Earl of Auckland**, the President of the Society:

My dear Sir, *Isle of Wight, May* 15, 1845.

I find that I cannot with any convenience return to London before Monday next, and I regret therefore that I must forego the honor of taking the chair, at the ensuing anniversary meeting of the Royal Asiatic Society. You well know that my absence will not have been caused by any want of interest in the welfare of the Society, and I trust that whoever of our Council may take my place upon this occasion will duly make my excuse. I should the more regret my absence if I could foresee that any question of difficulty is likely to arise, but on the contrary our Report will, I think, appear to be fairly encouraging, and, with the good help of those who are inclined to work with us, it seems to promise a continued and highly satisfactory prosecution of the objects for which the Society was instituted.

We have indeed lost some of the most valuable of our members, but, on the other hand, valuable accessions have been made to us, and I trust that we shall still be found to be strong and efficient as we have been to all our purposes. Any doubt, indeed, upon this head would be removed by a reference to the list of our newly elected Resident Members; and in our foreign correspondence we have particularly to congratulate ourselves upon the good will which has been manifested towards us by Mr. Davis, the Governor of Hongkong, and upon our renewed intercourse with Major Rawlinson, now Resident at Baghdad. From each of these interesting quarters we may look for communications of much value; and I would further remark, that we should endeavour to turn even our late heavy losses to account. Our Report already promises valuable matter from the papers of the late Sir Gore Ouseley. We may hope that our correspondents at Bombay will enable us to profit by whatever of information the late Dr. Malcolmson may have collected; and I feel that the Society should particularly exert itself in endeavouring to bring before the public the results of the labours of the late Mr. Griffith. We have been frankly and liberally seconded by the Government, by the Court of Directors, by the Trustees of the British Museum, and by many scientific societies, in our desire to have executed a work illustrative of the fossils and geology of the Himalayan Hills; and I think that we may look with confidence to the countenance of the Honourable Court, if we should join with others, in endeavouring to promote a publication upon the Flora of India, from the papers and collections which have been bequeathed to the Company by Mr. Griffith. I cannot doubt but that these materials will be found to be of great value; and I believe that the publication would be popular, and that it could be accomplished at comparatively a small expense. I should look with confidence, in such a work, to the assistance of Dr. Horsfield and Dr. Royle at the India House, and I am satisfied that we should have voluntary support from many other quarters. It should not be lost sight of, that such a work might possibly, beyond its own intrinsic value, have that of fulfilling the twofold object, 1st, of justly doing honor to the name of Mr. Griffith; and 2ndly, of conferring some advantage upon those whose dependence rested upon his valuable life. These are but a few amongst the many objects to which we may look for the employment of the ensuing year, and our Report will, I trust, have proved that we have not been idle in the year that has passed. I have not with me papers to which I can refer, but I recollect particularly with satisfaction the proposed publication on the Himalayan fossils, the drawings which are in progress from the caves of India, and the elucidation of the impression taken from the ancient inscription on the rock in Peshawer, presented by Mr. Masson, as amongst the works of importance which are, in a great measure, due to the Society; and I would not pass over the interesting translations which have issued from our press, and the increased number of papers which have found a place in our Transactions.

I have but further to say, that, though the condition of our finances is satisfactory, and our present income is sufficient to meet our present expenses, we must all feel that with increased means we could accomplish much more than we have yet accomplished, and that no exertions should be omitted which may promise to extend either the attractions or the efficiency of our Society. I could particularly wish that our rooms should be more generally resorted to; so that those who are interested in Asiatic subjects might be led conveniently and frequently to commune together; and, with this view, I would propose shortly to resume our evening meetings, and (for the day) it might be considered whether our library should not be made more complete as a library of reference; whether our number of periodical publications might not be advantageously increased; and particularly whether a day and hour might not sometimes be named, at which the presence of such Fellows of the Society as would like to assemble without the restraint of a formal meeting might be invited.

I am, very faithfully, &c.,

Auckland.

The Honorary Secretary then laid on the table a copy of the superb lithographic drawings of some of the chief Cave Temples of India, designed to illustrate the Essay published in the fifteenth number of this Society's Journal, which had been that morning presented by the Author, James Fergusson, Esq.

The Chairman then addressed the Meeting as follows:—

The letter from Lord Auckland just read shows how deeply our noble President, whether present or absent, is interested in the successful progress of the Society; and it is gratifying that this talented nobleman, who was respected and beloved by the Indian community, should, on his return to his native land, seek to elicit new information respecting that interesting country,—to connect the ties between the governing and the governed,—and still to connect himself with those gentlemen of the Service whose merits and qualifications he learned to appreciate abroad.

I see this good example emulated by many distinguished men recently returned from India. I hail with pleasure the presence of that accomplished gentleman, Sir Edward Ryan, who so long and so efficiently presided over the Asiatic Society at Calcutta, to whom it is our good fortune to do honour this day in inviting him to become a Vice-President of this Society. And when I perceive such men as Mr. Prinsep, Mr. Bird, Mr. Anderson, and others, thickening our ranks, I look forward with hope to better times; for I have no hesitation in saying that this Society has never been duly patronized and appreciated by the great body of retired servants from India, of whom we have only hundreds as supporters instead of thousands; and I do say they owe a debt to India—that country which has elevated them to fame and fortune—which it is their duty to discharge, by co-operating in those endeavours which must ultimately tend to expand the intellectual intelligence of the native population. I appeal to those high feelings they all possess, and entreat them to aid this great and good purpose.

Gentlemen, I am happy to say this desirable advance is fast progressing. The natives are gradually rising in our service to offices of trust; they perform high judicial functions with distinguished success; and are evincing a desire for knowledge which will more closely associate them with us in feeling and interest. In proof of this, I need only point out to you that we have in our present assembly four native gentlemen, who have volunteered to proceed to this country for the purpose of attaining a perfect medical and surgical education. To the honour of Dwárakanáth Tagore be it spoken, two of the number are provided for at his expense; of the other two, one will be maintained here at the expense of the East India Company, and the other is supported by a voluntary contribution. They are all placed under the charge of Dr. Goodeve, a gentleman high in his profession, who has long superintended the College of Surgery at Calcutta, and who, having overcome prejudices heretofore considered as insuperable, has successfully there taught the practice of anatomy. These, Gentlemen, are great strides in civilization; and I cannot but remark how much we are indebted for progress in science to the successful exertions of the Medical Members of the Company's Service; in support of this observation I would especially refer to the names of Dr. Horsfield, Dr. Royle, and Dr. Falconer.

In reviewing the names of departed benefactors, as enumerated in the obituary of the Report, I must say a few words in honour of my lamented friend, Sir Gore Ouseley, under whom I long served at the Court of Persia. He was an accomplished Oriental scholar, and was not only a correct speaker, but an able writer of the Persian language. He conducted his official correspondence on all delicate subjects with the Persian Ministers in his own handwriting, with a perspicuity of style, a propriety of idiom, and a skill in penmanship, which won the admiration of the Court. He obtained quite as much by amenity of manner, and by imperturbable placidity of disposition, in the conduct of diplomatic intercourse, as he won by readiness of talent. During our long intimacy I have seen him tried in varied circumstances, but I never knew him wound another's feelings, or make an unkind remark regarding an absent person; and he never omitted an opportunity of doing friendly offices.

I would wish to awaken your sympathies to the loss of a very talented and efficient public servant, the late Mr. John Lyall, Advocate-General of Bengal. This gentleman, brought up at Haileybury, and early imbibing an interest in whatever concerned the welfare of our Indian Empire, zealously connected himself with the proceedings of the Asiatic Society at Calcutta. And I will mention, what may not be known to all, that he undertook to deliver lectures on law to native students at Calcutta; so happily successful had been his endeavours, and so warmly had he attached this class to him, that they desired at his death to place a tablet in the church commemorative of their sense of his exertions for their benefit. If these results should induce others to imitate his good example, they will find, as he did, that such offices are highly appreciated.

On the subject of native education generally I shall scarcely venture to touch, having on my left a gentleman whose powerful mind has been so successfully exercised in its promotion,—I allude to our respected Director, Professor Wilson. The extent to which the East India Company have encouraged the dissemination of learning, and the large amount annually appropriated to this purpose, are not sufficiently known. My indefatigable colleague and friend, Colonel Sykes, has most usefully employed his leisure in preparing "Statistics of the Educational Institutions of the East India Company in India," showing the successful working out of these laudable endeavours by the local authorities at the three Presidencies, and exhibiting a proficiency attained by native students on scientific and literary subjects scarcely to be credited by those who have not examined or weighed the indubitable evidence of acquirement elicited in the examination of candidates for scholarships. I shall take the liberty of sending to the Society some copies of this compiled digest.

Gentlemen, I will only observe, in conclusion, that both in great governments and in small associations, the state of the purse is the criterion of prosperity: we cannot submit to that test. If the Indian community in England do their duty, our scale of utility may be vastly expanded.

Sir Edward Ryan said:—Sir, The Resolution which I hold in my hand requires no prefatory observations to ensure its adoption by the Society. It is sufficient that I should say it relates to the noble President, whose constant and zealous endeavours to promote the advance of literature and science in Asia and Europe, are well known to those by whom I am surrounded. It was my good fortune to be in India during the whole of the period when the Noble Lord presided over the government of that country; and in the character of President of the Asiatic Society of Bengal, the parent of this Institution, I had frequent opportunities of witnessing the great interest he took in advancing and encouraging the efforts of the Society. Its funds were increased by additional donations from Government, and the Society was thereby enabled greatly to enlarge its Museum of Natural History; to appoint a well qualified Curator, and to establish a Museum of Economic Geology; a Museum most useful for the purposes of comparison, and calculated to assist in developing the mineral resources of India. Nor was this all. His Lordship, in the selection of the localities for public officers, was not unmindful of the useful purposes to which the leisure of those officers might be applied, after the exigencies of the public service were satisfied. Men of talent and information were frequently placed where they might most advantageously employ such leisure as they could command, to the extension of knowledge in the particular branches of literature or science to which they were addicted. To one instance I cannot refrain from alluding: in the midst of all the preparation for that expedition to China which was crowned with such signal success, and in the consideration of Naval, Military and Commissariat arrangements, the Noble Lord was not unmindful of science. He knew that facts might be observed by many men who could not make use of them for the valuable purposes which they were fitted to answer. Such persons chiefly needed to be told where they should look, and what they should seek for. His Lordship caused to be prepared and distributed among those who were sent on that expedition, a manual which would show them what to observe, in order that facts might thus be collected which should be dealt with afterwards for the benefit of science, by those who could appreciate their value, and draw from them legitimate results. I cannot help also alluding, in the presence of Dr. Goodeve and the native gentlemen formerly students of the Medical College at Calcutta, to what the fostering care of the Noble Lord has done for the Institution. It was under his Government that it assumed its present thriving and enlarged condition. He made all the arrangements,—selected most able and zealous gentlemen to fill the different chairs, and ultimately, when the students became qualified for practice, placed them at the principal cities of the Bengal Presidency in the charge of dispensaries, and thus gave to the natives, through their own countrymen, advice, medical and surgical, which they would shrink from receiving at the hands of Europeans.

It is unnecessary that I should say what the Noble Lord has done for the objects of this Society since his return to Europe; since he has been placed in your chair, you have been witnesses to his constant attendance at your meetings, and to his zealous and unremitting endeavours in all ways to promote your interests. In the Council, we who have had the honour of being associated with him, have seen the sound judgment which he has exercised in the management of all that relates to the Society.

The Society will pardon me if, before I sit down, I return thanks to our Chairman, Sir Henry Willock, for the kind mention he has made of my name, and for the flattering intimation that has been given of the intention of proposing that I should fill the office of one of your Vice-Presidents. I beg to move,—

"That the thanks of the Society be given to the Right Honourable the President, for his constant and ready attention to the affairs of the Royal Asiatic Society, and his unceasing endeavours to increase its efficiency and promote its interests."

The motion being seconded by the RIGHT HONOURABLE HOLT MACKENZIE, was carried unanimously.

Mr. H. T. PRINSEP, in proposing a resolution of thanks to Sir Henry Willock, observed, that it must be highly gratifying to every member of the Society to see a gentleman presiding upon an occasion like the present, who so honourably filled the chair of the great Company with which so many of those present had at one time been connected. He regarded the circumstance as an evidence of the good feeling towards the Society, which subsisted amongst those who had the direction of the affairs of that Company; and he felt satisfied that the Society might always be sure of a friend who would support its reasonable requests, and exert himself to assist its important purposes, so long as Sir H. Willock was a member of that Direction. If the Chairman had not personally assured the Meeting of his goodwill and devotion to those purposes, the proof of it existed in his past career, and in the services he had rendered to Oriental science and literature. For during a distinguished career in a quarter of Asia possessing in many respects peculiar interest to the student and to men of science, he never lost sight of the advantages which his influence and position afforded for inquiry and research, and with ardent zeal he devoted himself to the study of the living literature of the country in which he was so happily placed. During his service in Persia, Sir H. Willock formed a collection of Arsacidan and Sassanian coins, which is unequalled in completeness, and with rare liberality he had, since his return to Europe, presented his cabinet to the museum of the East India House. But Sir H. Willock had other claims to the thanks and gratitude of this Society, for he had long been an active Member of its Council, and in the midst of avocations public and personal never hesitated to make the sacrifice of his valuable time and convenience to assist in its pursuits, and in the general business of the Society. He had now given an example of his devotion, and of the interest he felt in its welfare, by devoting to the Society a large portion of a day, which every one would be sensible could ill be spared from the calls of such a situation as he now filled, in the administration of our great Empire in the East.

With these observations Mr. H. Prinsep moved, "That the special thanks of this Meeting be given to Sir Henry Willock, the Chairman of the East India Company, for his kindness in presiding on the present occasion, and for the interest which he has evinced in the prosperity and usefulness of this Society."

The motion was seconded by CAPTAIN EASTWICK, and carried unanimously.

JOHN MAC PHERSON MACLEOD, Esq. moved :—

"That the thanks of the Meeting be given to the Director, the Vice-Presidents, and the Council, for their zealous and able direction of the Society's operations during the past year."

Seconded by COLONEL DICKENSON; and carried unanimously.

The DIRECTOR, in acknowledging for himself and for the Vice-Presidents the favourable opinion of their services expressed by the Meeting, begged to assure the Members of their undiminished interest in the credit and prosperity of the Society. Their exertions for these objects were, however, scarcely called for, as the personal share taken in their proceedings by their present noble President, and the efficient manner in which their zealous and able Secretary discharged his functions, left little for the other officers of the Society to perform. These examples, however, served rather to animate than repress their interest and zeal, and the Society might be satisfied that he and his colleagues would continue, in as far as lay in their power, to contribute to the Society's permanence and prosperity.

SIR GEORGE STAUNTON moved, "That the thanks of the Meeting be rendered to the Secretary, the Treasurer, and the Librarian, for the attention and ability with which those officers have discharged their several duties."

Sir George said he felt it would be quite unnecessary for him to speak at any length respecting the important advantages the Society had reaped from the services of our excellent Secretary. He was persuaded that they were already perfectly well known and appreciated by every one present. Although he would be one of the last to undervalue the eminent services which had been rendered to the Society by our noble President, our learned Director, and by his distinguished brother Vice-Presidents, yet he must say that the office of Secretary was one of such paramount importance, in such an Institution as ours, that it appeared to him that the zeal and ability with which, regardless of the sacrifice of his time, its duties had been discharged by our present Secretary, had, in a more peculiar degree, contributed to the increased efficiency and generally improved condition of the Society, which it was so agreeable to hear announced in this year's Report.

The Society, Sir George observed, had equal reason, this year, to feel satisfied with the tendency to improvement in its finances, and the care which had been bestowed upon them by our worthy Treasurer, who, he felt confident, possessed such zeal for our interests, that he heartily responded to the general wish that his duties and responsibilities might annually increase and become heavier.

Similar commendation might justly be expressed with respect to the manner in which the duties of his office had been performed by our esteemed Librarian, who had the charge not only of our Library, but of our Museum. With respect to this department of our Society, he felt compelled to observe that its present inadequacy, and the slowness of its progress towards completion, could not with any justice be attributed to any want of zeal or alacrity in the Members of this Society in offering contributions, but solely, in fact, to the repeated disappointments we had hitherto unfortunately experienced in our endeavours to obtain a suitable locality at the public charge (such as had been granted to many other Institutions, possessing, in our opinion, inferior claims) for the reception of our collections. He was far, however, from despairing that the claims of the Royal Asiatic

Society would yet receive a just consideration, and that our Society would ultimately obtain that share of public favour and patronage to which it was, on public grounds, so well entitled.

Before he sat down, Sir George said, he could not but advert to the last very agreeable service our Secretary had rendered to the Society by conveying to the Chairman of the Court of Directors of the East India Company our unanimous wish that, under the existing circumstances which had deprived us of the presence of our noble President, he would do us the kindness, in his capacity of a Vice-Patron of the Society, to take the chair at the present anniversary. Sir George said he thought it was impossible to express too strongly the obligations we were under to him for having at once, and in the handsomest manner, yielded to our request. His justly-esteemed personal character, his important public services to his country abroad, and his present eminent official station at home, which places him in intimate relation, not only with the East India Company, over which he presides, but also occasionally with the Queen's Government, render the favour which he has conferred on us, by presiding here this day, and delivering to us from the chair the excellent and important address we have just heard, a testimony to the Society which is equally honourable and encouraging.

Mr. Clarke said that he could not but feel that the flattering commendations so kindly bestowed upon his humble exertions in the service of the Society by their highly respected Vice-President, Sir George Staunton, far exceeded their real value, for the only merit he could claim for them was that they were most willingly rendered. If he was enabled to facilitate the progress, and further the objects, of those whose labours and researches contributed to the usefulness and upheld the character of this important Society, he felt himself highly honoured in being thus engaged. But the Secretary of the Royal Asiatic Society ought himself to add to those stores of knowledge, and to enlarge the boundaries of learning and science. He looked forward to the period when some such gifted person would assume the duties of Secretary; till that should be the case, however, and so long as his services were viewed in so favourable a light, and received in a manner so gratifying to his feelings, he could not but deem it a privilege to continue his best exertions.

He must, however, be allowed to advert to the great claims which his excellent coadjutor, Mr. Norris, had upon the notice and esteem of the Society. Besides the constant attendance he gave at the Society's house,—his readiness at all times to impart the varied and extensive knowledge he possessed, in languages, history, geography, and science generally, especially as connected with the East, his favourite field of research,—he had lately laboured with untiring perseverance, laborious minuteness, and successful a well as scrupulous care, to prepare a faithful transcript of a very important inscription, of which portions only had, during a course of many years, been rendered accessible to the Oriental archæologist. This important achievement had well entitled him to the most honourable commendation, which he solicited on behalf of him whom he might fitly term his better half.

MR. ELLIOTT returned thanks, and said that he had every hope that the Society would become more prosperous; and that any additional trouble which should be thrown on him from that cause would be to him a source of additional gratification.

MR. SHAKESPEAR returned thanks.

SIR GEORGE STAUNTON said that, having been the mover of the thanks to the officers of the Society, he was anxious to express his cordial assent to the proposition to include in that vote the name of the Assistant Secretary, Mr. Edwin Norris. His valuable labours, and his general zeal and assiduity in his office, have long been known and felt by the Society, but have recently been brought more prominently into view by his interesting and remarkably successful labours in tracing and explaining the extraordinary inscription from Kapur di Giri.

Sir George therefore considered Mr. Norris in every way deserving of the proposed testimony of the confidence and approval of the Society.

MR. NORRIS rose to thank the Meeting for the unexpected honour done him. He said his anxious wish was to discharge his duty with fidelity; and he trusted he could claim credit so far. With regard to the occasion which had obtained for him the present distinction, he felt that he owed much of it to a lucky accident, and to the suggestion of a friend more learned than himself. He begged to be allowed to express his sincere thanks to all for the kindness with which his endeavours were received, and more especially to those with whom his official duties more closely connected him, whose kindness made that a pleasure which might otherwise be an onerous duty.

SIR ROBERT CAMPBELL moved, "That the renewed and cordial thanks of this Society be offered to James Alexander, Esq., for his third munificent donation to their funds, and for the lively interest he has evinced in their affairs by the judicious and discriminating directions regarding the appropriation of his noble gift."

The motion was seconded by DR. HORSFIELD; and carried unanimously.

HENRY S. GRÆME, ESQ., and DR. ROGERS having been appointed Scrutineers, the Meeting proceeded to ballot for the officers of the Society and for the new Members of Council.

The following was the result of the ballot :—

THE RIGHT HON. SIR EDWARD RYAN was declared unanimously elected to the office of Vice-President of the Society, vacant by the death of the Right Hon. Sir Gore Ouseley.

The nine undermentioned gentlemen were unanimously elected into the Council, to fill up the vacant places of those Members who go out by rotation :—

The Right Hon. the Earl of Powis.
The Right Hon. Lord Viscount Jocelyn, M.P.
The Right Hon. Lord Francis Egerton, M.P.
Sir Thos. Edw. Colebrooke, Bart., M.P.
Major-Gen. J. Briggs, F.R.S.
Major-Gen. J. Caulfeild, C.B.
James Fergusson, Esq.
Capt. Wm. J. Eastwick.
G. W. Anderson, Esq.

On the motion of the DIRECTOR, the thanks of the Meeting were unanimously voted to Sir Henry Willock for his able and courteous conduct in the Chair.

The compliment was acknowledged by the Chairman, and the Meeting adjourned to the 7th June.

LONDON : HARRISON AND CO., PRINTERS, ST. MARTIN'S LANE.

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OF

THE ROYAL ASIATIC SOCIETY

OF

GREAT BRITAIN AND IRELAND.

CORRECTED TO THE 30TH OF JUNE,
M.DCCC.XLIV.

1844.

A

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